



Central Connecticut State University

2013 Transportation Plan: Studies



Prepared by the Central Connecticut Regional Planning Agency

Acknowledgements

This transportation demand management plan was prepared by the Central Connecticut Regional Planning Agency (CCRPA) for the Central Connecticut State University. Production of this plan would not have been possible without the support of CCSU staff, faculty, and students. The President's Advisory Committee on Environmental Sustainability, the Student Government Association, Facilities Management, and Residence Life were instrumental to its production. Numerous student groups offered advice, feedback, and a forum for addressing CCSU students.

This plan was prepared in cooperation with the U.S. Department of Transportation (including its participating agencies) and the Connecticut Department of Transportation. The opinions, findings, and conclusions expressed in this publication are those of the Central Connecticut Regional Planning Agency, and do not necessarily reflect the official views or policies of the Connecticut Department of Transportation and/or the U.S. Department of Transportation.

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Transportation Survey



Introduction

In May 2012 the Central Connecticut Regional Planning Agency distributed a survey to all students, faculty, and staff at Central Connecticut State University to collect data regarding transportation options at the university. Questions in the survey focused on current modes of transportation to/from the university, likelihood of using other modes of transportation, and impediments to the use of other modes of transportation. A total of 13,274 surveys were distributed to students, faculty, and staff; 1,801 surveys were completed and returned for a 13% response rate. Of the students who responded, 78% lived off campus and 22% lived on campus. This is within 2% of the entire student body.

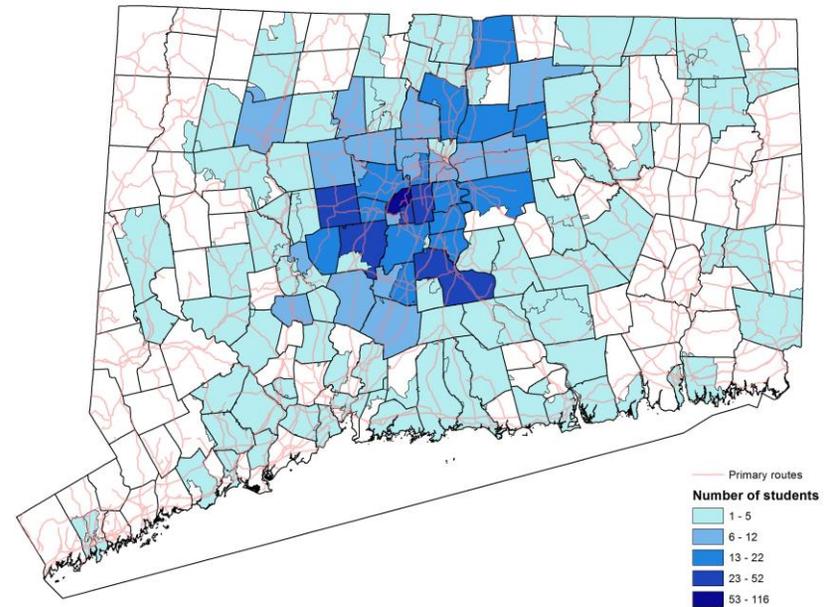


Figure 1. Students by zip code and town

Survey Results

The survey asked students and faculty/staff to identify where they live, by zip code. While a broad range of responses were received, the vast majority were clustered in the general Hartford and New Britain areas. They were also clustered along major transportation corridors. Faculty and staff tended to be much more centralized than students.

Municipality	Students	Percentage
New Britain	423	35%
Newington	52	4%
West Hartford	45	4%
Middletown	42	3%
Bristol	35	3%

Table 1. Top five municipalities for students

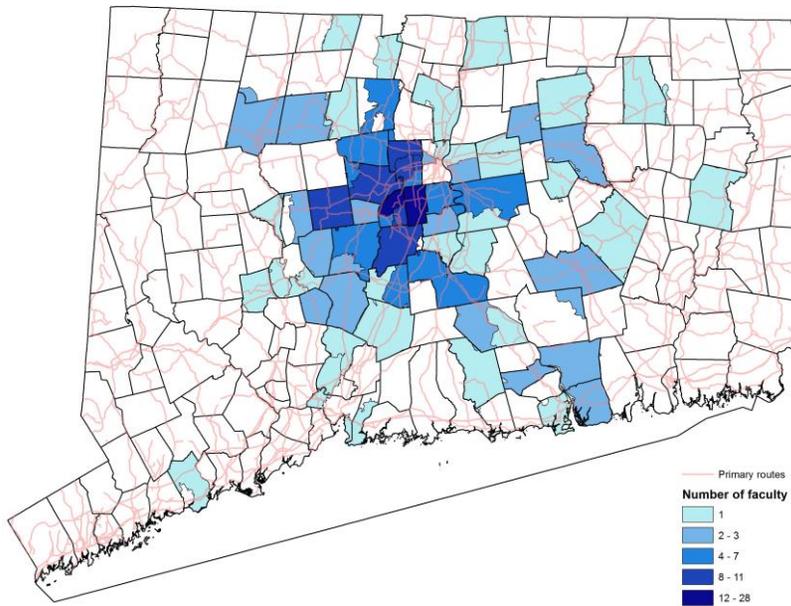


Figure 2. Faculty/staff by zip code

The most popular municipalities also tended to be highly clustered, though there were some variations between students and faculty/staff. While both groups favored New Britain, faculty and staff were much more likely to live in West Hartford. On the other hand, Hartford and Middletown were popular locations for students but did not appear in the top ten for faculty and staff.

The survey asked students and faculty/staff what form of transportation they currently use to travel to/from the university. Respondents

Municipality	Faculty/staff	Percentage
New Britain	44	18%
West Hartford	36	14%
Newington	21	8%
Berlin	9	4%
Bristol	8	3%

Table 2. Top five municipalities for faculty/staff

were asked to select from drive, walk, ride the bus, carpool, or bike. Unsurprisingly 86% of students responded that they drive to campus while very few students responded that they walk (7%), take the bus (3%), carpool (2%), or bicycle (.4%) to campus. Faculty/staff responses revealed similar findings with the majority (94%) driving to/from campus while very few walk (3%), take the bus (2%), carpool (1%), or bicycle to campus (2%).

Likelihood of choosing a mode

Given that driving was revealed as the main mode of transportation used by both students and faculty/staff, the survey sought to determine the likelihood that respondents may shift to other modes of transportation. Other modes of transportation include walking, taking the bus, carpooling, and riding a bicycle. Student responses showed the majority students are not likely to consider switching to

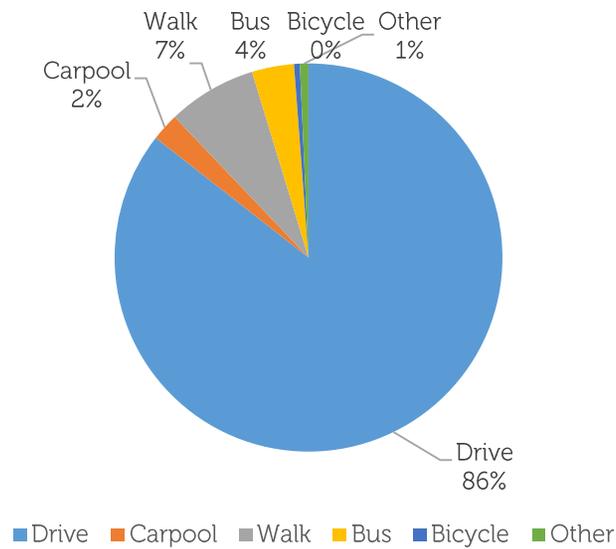


Figure 3. Student mode share

another mode of transportation; 85% of students responded that they have never biked nor are they considering it, 79% responded they have never taken the bus nor are they considering it, and 78% of students responded they have never walked nor are they considering it. Students seemed more willing to carpool with 23% responding that they have considered it and 20% responding they have car-pooled, but not regularly.

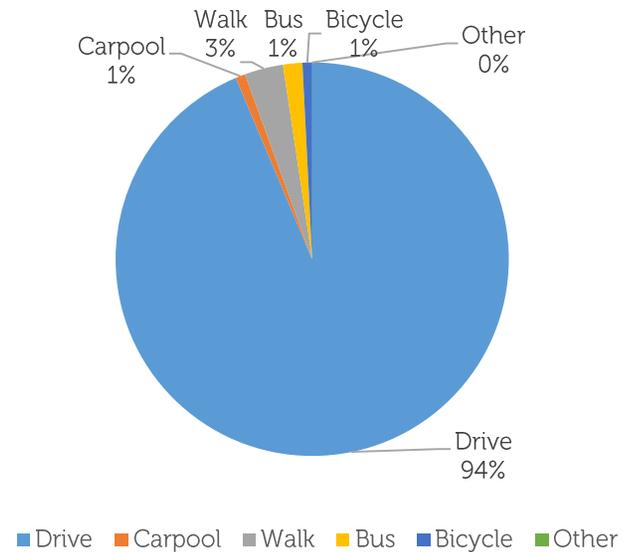


Figure 4. Faculty/staff mode share

The faculty/staff had similar responses regarding the likelihood of shifting to other modes of transportation; 77% responded they have never biked nor are they considering it, 71% responded they have never taken a bus nor are they considering it, and 83% responded they have never walked nor are they considering it. Consistent with student responses, faculty/staff were also more willing to carpool.

Opinion		Bike		Walk		Carpool		Bus
At least once a month	2	1%	5	2%	6	2%	1	1%
Have considered it	41	16%	18	7%	59	23%	57	23%
Have done it, but not regularly	13	5%	11	4%	32	13%	12	5%
Have not done it and am not considering it	194	77%	209	83%	148	59%	178	71%
More than once a week	2	1%	9	4%	7	3%	4	2%

Table 4. Faculty/staff mode consideration (2012)

Opinion		Bike		Walk		Carpool		Bus
Have not done it and am not considering it	963	85%	892	78%	496	44%	899	79%
At least once a month	8	1%	21	2%	66	6%	6	1%
Have done it, but not regularly	23	2%	55	5%	233	20%	31	3%
Have considered it	131	12%	53	5%	261	23%	159	14%
More than once a week	13	1%	117	10%	82	7%	43	4%

Table 3. Student mode consideration (2012)

Impediments: Students

Respondents were also asked questions regarding impediments for each mode of transportation. Responses to these questions were separated depending on a number of factors, such as type of respondent, where the respondent lives, and how often they have tried various modes of transportation. While many factors were identified

as impediments, several of the factors were rated very high. These responses can be used to design programs and policies.

In this section we only consider student respondents. This is done for a number of reasons. The first is that too few faculty/staff members responded that they used (whether occasionally or frequently) different modes of transportation. The second is that students great-

ly outnumber faculty and staff and are thus a much bigger target for interventions.

Walking

Distance was a major factor in determining whether or not a student would choose to walk. The majority of students responded that the distance to campus is too far from where they live to walk; a smaller, though still large, percentage also responded that they work too far away from school to make walking an option. This is mostly a concern for respondents who have off-campus jobs. Related to this concern was that many respondents felt they need a car in case of emergencies. Respondents were not asked for specific examples, but some wrote in that they need to be able to pick up kids from school or day-care.

Safety was not as great of a concern as was initially assumed. Each of the safety related impediments, such as “crime” or insufficient lighting at night” were cited by less than 20% of respondents.

Safety was a much bigger concern for students who currently walk to campus more than once a week or at least once a month (see Appendix A: Additional data tables). Lack of lighting at night was cited by 30% of these students and unsafe sidewalks/street crossings was cited by 25%. Crime was also a big concern for 23% of walkers.

Reason	Percent
School is too far from home	66%
Work is too far from school	35%
Need a car in case of emergencies	28%
No convenient routes	19%
Insufficient lighting at night	18%
Crime	17%
Sidewalks and street crossings are unsafe/missing	16%
Sidewalks not maintained in winter	13%

Table 5. Top impediments to walking

Biking

Students also cited distance factors as impediments to biking. Both distance from home, and distance to work, were cited by large percentages of respondents (58% and 31% respectively).

The street network was also of concern to respondents when considering cycling. A quarter of respondents cited the lack of bike lanes while 22% felt the roads were unsafe and 21% felt there was too much traffic. Other safety issues such as traffic speed, lighting, road/sidewalk maintenance, and bike storage, were less likely to be cited as significant impediments.

Reason	Percent
School is too far from home	58%
Work is too far from school	31%
Need a car in case of emergencies	28%
No bike lanes or paths	25%
Roads are unsafe	22%
Too much traffic	21%
Roads/sidewalks not maintained in winter	19%
Insufficient lighting at night	19%
No safe place to leave my bike	16%
Cars go too fast	15%
Lack of showers/changing facilities on campus	11%

Table 6. Top impediments to biking for students

For students who currently ride at least once a month, safety was a big concern. Of note was that 38% of these respondents cited the lack of bike lanes as an impediment. Occasional and frequent bikers were also concerned about traffic speeds, road maintenance during winter months, and lack of lighting (all garnered 24% of responses). Finally, bikers were much more likely to be concerned with the availability of showers (24%).

Taking the Bus

The primary impediment cited by students was that the bus takes too long. Another major impediment that prevented students from tak-

ing the bus was a lack of bus routes where they live. In fact 38% of students who have considered taking the bus cited this as the top factor preventing them from using the bus. Students also cited the complexity of the system and a need to have a car in case of emergencies as reasons not to take the bus.

Carpooling

While carpooling was identified as the most appealing alternative transportation mode compared to walking, biking, and taking the bus, students and faculty/staff cited a number of factors that have prevented them from carpooling. The majority responded there are either no carpools where they live or existing carpools don't match their schedule. Other respondents indicated they don't know where to find a carpool; almost half of students and a quarter of faculty/staff who have considered using a carpool don't know where to find one.

Impediments: Faculty/Staff

Walking

Distance was by far the most important impediment to faculty and staff walking, with 73% of them citing it. The rest of the impediments were closely clustered with concerns about sidewalks at the top and crime as the bottom.

Biking

Cycling had a more even distribution of concerns. The top concern again was distance, with 54% of respondents citing it. Vehicle speeds on the roads and winter maintenance were both at 23% while the need for a car in case of emergencies was cited by 20% of respondents. Lack of bike lanes, too much traffic, and unsafe roads all came in at just over 30%. Less than 20% of respondents cited showers, lighting, and safe bike storage as concerns.

Taking the bus

The most popular impediment to taking the bus was a lack of buses near the respondent's home, cited by 40%. This was followed with concerns about how long the bus takes. Complicated bus routes de-

Reason	Percent
School is too far from home	73%
Sidewalks and street crossings are unsafe/missing	15%
Sidewalks not maintained in winter	13%
Need a car in case of emergencies	13%
Insufficient lighting at night	13%
No convenient routes	9%
Work is too far from school	8%
Crime	7%

Table 8. Top impediments to walking (faculty/staff)

Reason	Percent
School is too far from home	54%
No bike lanes or bike paths	33%
Too much traffic	32%
Roads are unsafe	31%
Cars go too fast	23%
Roads/sidewalks not maintained in the winter	23%
Need a car in case of emergencies	20%
Lack of showers/changing facilities on campus	17%
Insufficient lighting at night	16%
No safe place to leave my bike	12%
Work is too far from school	10%

Table 7. Top impediments to biking (faculty/staff)

ter 28% of respondents while the need for a car in case of emergencies deterred 26%. Timing of bus runs was a concern for just 21% of respondents.

Carpooling

Similar to student respondents, faculty and staff showed no clear preference for one or more impediments to carpooling. The lack of an existing carpool near the respondent's home was the most popular choice and was cited by 33% of respondents. Not knowing where to find one and needing a car in case of emergencies both received

Reason	Percent
No bus where I live	40%
Takes too long	36%
Too complicated (too many transfers)	28%
Need a car in case of emergencies	26%
Buses do not run early or late enough	21%
Buses are unreliable/not on-time	17%
No bus where I work	14%
I feel unsafe waiting for/riding the bus	10%
Don't know how to use the bus	9%

Table 10. Top impediments to taking the bus (faculty/staff)

25%. Concerns about scheduling were cited by just under 20% of respondents.

Free-form Comments

Both students and faculty/staff were given the opportunity to offer free-form comments. We received 61 comments from faculty/staff and 230 from students. The largest number of student comments concerned parking (114), followed by the bus or shuttle (60). Faculty/staff were more likely to comment on the bus system (20), followed by parking and biking (9 each).

Comments regarding the bus primarily concerned the complexity of the system (too many transfers) and the length of time the bus/shuttle takes. A few people requested specific routes (Wallingford, Vernon, Litchfield Hills, East Hartford, University of Hartford, and Waterbury). A few cited safety concerns regarding the CTTRANS-IT system (two cited on-bus concerns and one cited the stop on Ella Grasso Boulevard). Numerous people asked for shuttles to common shopping destinations. Many students expressed a lack of knowledge of the bus system (that it didn't even exist) or a lack of knowledge of how it works and where it goes. At least five students complained about the cost of the bus (that no discounted student rate is available at CCSU). A few students complained that the shuttle does not run often enough, or match class schedules, and five students described numerous reliability issues. At least two students suggested

Reason	Percent
No carpools where I live	33%
Don't know where to find one	25%
Need a car in case of emergencies	25%
Existing carpools don't match my schedule	19%
Too much time spent waiting on/picking up others	17%
Need to work after school	13%
I feel uncomfortable riding with strangers	8%

Table 9. Top impediments to carpooling (faculty/staff)

bus stops that are more central for students (such as the loop by the student center).

Most of the comments about walking related to safety issues. A few complained of general safety issues (that New Britain is not safe). One student and four faculty/staff complained of inadequate sidewalks. A few complained of speeding cars on Paul Manafort. One student complained that too many students jaywalk. One student cited the weather as a major impediment.

Respondents also had safety concerns regarding cycling. Four of the nine faculty/staff respondents mentioning cycling complained about a lack of bike lanes, speeding drivers, and generally unsafe roads. One student suggested a bike rental program, one complained of inadequate infrastructure, and two mentioned weather concerns.

Respondents mentioning parking fell into a few camps. Those that believe there is simply not enough parking, and those who believe available parking does not meet their needs. Faculty were primarily concerned with a lack of reserved parking. Students wanted parking in closer proximity to their classes. A few students cited safety concerns within the garages (due to poor driving).

Other responses to the open ended question include: working full-time; having other responsibilities; living too far from campus; enjoy-

ing driving; driving is fastest and safest; and a desire for financial help with commuting costs. One faculty member stated that nearby housing is too expensive. A few students complained that on-campus dining is limited to the hours of 10am to 6pm on the weekends.

Specific locations

Respondents were also able to list specific locations that they have difficulty getting to without a car. By far, the most common answer was a grocery store (at least 50 students, out of 300 providing answers, and 12 faculty/staff respondents mentioned “grocery store” or Stop & Shop). The mall came in second with over 34 student responses and four faculty/staff responses. A few students mentioned difficulty getting to field study locations (for student teaching and “clinical”). Other popular destinations included Hartford, West Hartford, and the Berlin Turnpike.

Trends

In March 2013, CCRPA distributed a second survey to students and faculty. There was a much lower response rate for this survey, probably due to the fact that the survey was sent out the day before students left for spring break. This survey had 261 student responses, compared to the 1,249 student responses in 2012, and 250 faculty

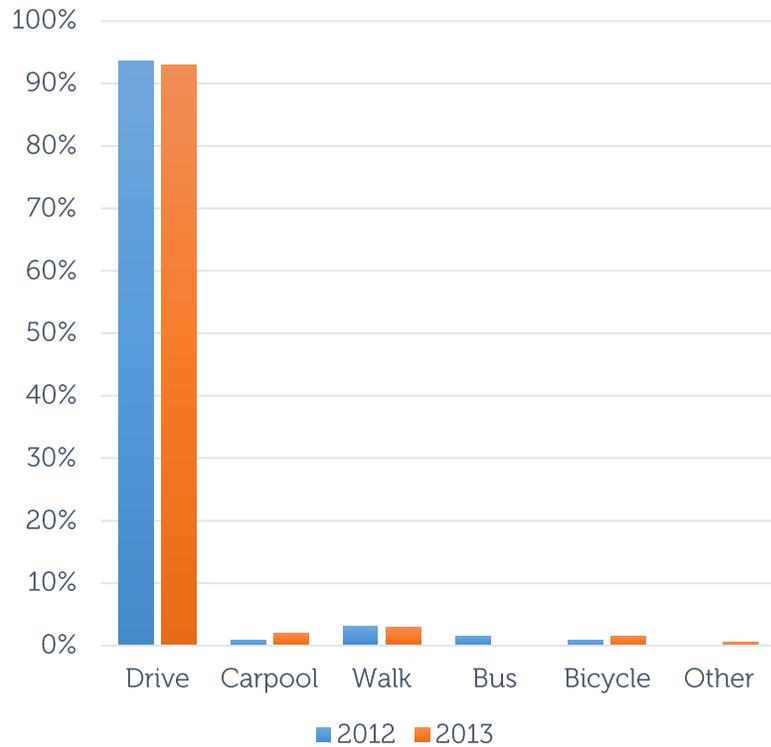


Figure 5. Change in mode share (faculty/staff)

responses, which was about the same as the 2012 survey. The second survey provided information on students and faculties transportation preferences and concerns, as well as trends compared to the survey distributed in May 2012.

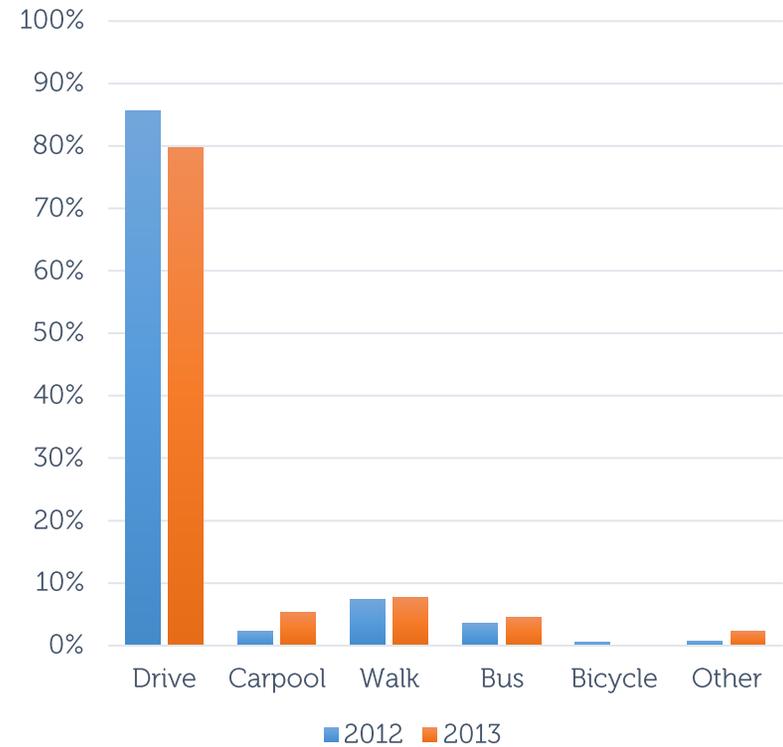


Figure 6. Change in mode share (students)

The second survey showed that fewer students are driving alone from 86% to 80% from last year's survey. There was an increase in the number of students carpooling and taking the bus. Walking also showed a small gain of 1%. The number of cyclists decreased, but the sample size was much smaller and the number of cyclists in the first survey low enough that this result could be a sampling error.

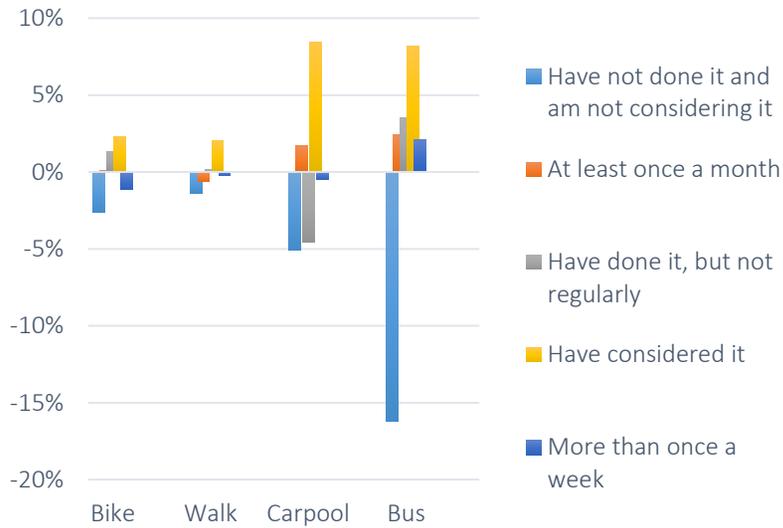


Figure 8. Change in mode consideration (students)

Student's consideration on using the bus has increased from 14% to 22% from last year, but the number of responses was lower than the first survey. The students responses were 82% who have not tried biking nor are they considering it; 77% said that have not tried walking nor are they considering it; 38% said that have not tried carpooling nor are they considering it; and 63% said they have not tried using the bus nor are they considering it. These percentages are a decline from the 2012 survey. Each mode of transportation had an increase in students considering using them.

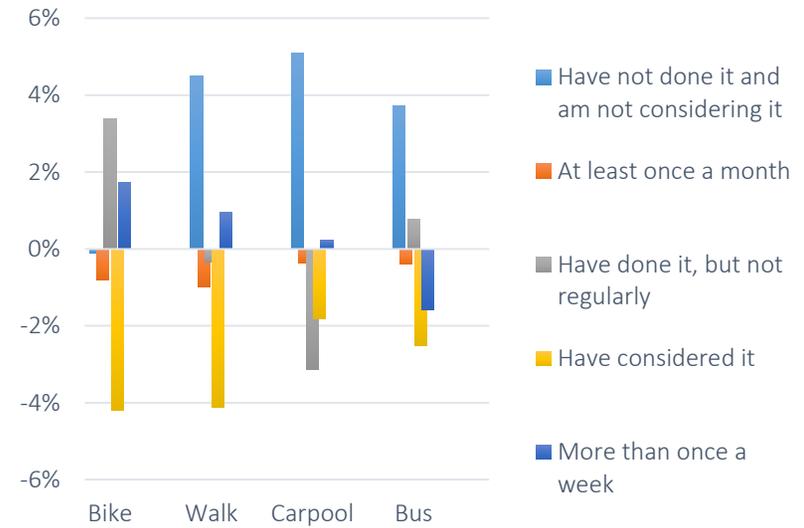


Figure 7. Change in mode consideration (faculty/staff)

The faculty survey showed fewer changes in mode share but fairly significant ones in mode consideration. Mode share was relatively constant but did show a slight decrease in driving alone. Mode consideration, however changed dramatically. All modes showed a decrease in "have considered it" and an increase in "have not considered it". Biking, walking, and carpooling showed small increases in "more than once a week".

Opinion	Bike		Walk		Carpool		Bus	
Have not done it and am not considering it	196	82%	184	77%	92	38%	150	63%
At least once a month	2	1%	3	1%	18	8%	7	3%
Have done it, but not regularly	8	3%	12	5%	38	16%	15	6%
Have considered it	33	14%	16	7%	75	31%	53	22%
More than once a week	0	0%	24	10%	16	7%	14	6%

Table 11. Student mode consideration (2013)

Impediment: Students

Students were able to give their reasons for not using other forms of transportation and to see what the top impediments were. The results for the highest rated impediment for walking, biking, and taking the bus stayed the same from the first survey. The top impediment for carpooling for the second survey was that students did not know where to find one. The top impediment for the bus was that it takes too long, and for biking and walking it was school is too far from home or work. Many students responded saying they need a car for emergencies.

Although this was not included in the first survey, weather was an impediment for students not using other forms of transportation. 39% of students said they would not bike to campus in the winter weather and 28% would not use the bus too

Safety was another concern for students. The roads and sidewalks were not safe or well-maintained to walk or bike on them. There is insufficient lighting on the streets and sidewalks. 30% of students said they would not walk because of crime, an increase from the 17% from the first survey. 32% of students do not bike because there are no bike lanes, an increase from the 25% of students from the first survey.

Opinion	Bike		Walk		Carpool		Bus	
At least once a month	0	0%	2	1%	4	2%	0	0%
Have considered it	24	12%	6	3%	43	22%	40	20%
Have done it, but not regularly	17	9%	8	4%	19	10%	11	6%
Have not done it and am not considering it	153	77%	174	87%	127	64%	148	74%
More than once a week	5	3%	9	5%	6	3%	0	0%

Table 12. Faculty mode consideration (2013)

Comments

Many students and faculty provided comments on the second survey on what they would like improved or changed on campus. There were 104 comments from the students, a decrease from the first survey and 87 comments from the faculty/staff, an increase from the first survey. The largest number of student comments were of the bus and shuttle (35), followed by biking (20). Parking was also an issue, but only 9 comments on it. The largest number of faculty and staff comments were of the bus and shuttle (20), followed by parking, walking, and biking (5 each).

The bus and shuttle schedules and routes were a main concern with students, faculty, and staff for the second survey. Many of the concerns were the same from the first survey like the complexity of bus

schedule and the number of transfers. There are complaints that the bus and shuttle schedule does not match the class times and is unreliable. Many people want to see buses going to other parts of the state like Waterbury, Wallingford, and the Massachusetts border; as well as shopping areas like Stop and Shop. Many faculty and staff are looking forward to the new CTfastrak Busway and are considering using it when it opens.

Many respondents complained about the parking situation on campus. Many of the student's comments were the same as the first survey on how there is no parking and it is hard to find a parking spot. This causes them to be late to class. Faculty members have commented that student's park in the faculty lot, especially in the Manafort Lot. They would like to see more faculty-only parking.

Respondents had many safety concerns for walking to campus. Students have mentioned that the infrastructure is not safe to walk and is not well-maintained. One student mentioned that they do not like to walk in the cold. A couple students complained that cars are speeding on the streets and around the corner of the exit of Copernicus Garage. Both students and faculties have said that school is too far to walk to. One faculty/staff member suggests building foot bridges over Paul Manafort and Stanley, because those streets are dangerous and many people jaywalk.

There are also safety concerns for biking to campus, where both students and faculty have mentioned that lack of infrastructure for bicycles. The surrounding streets are unsafe to ride a bike on. One student mentioned connecting a bike path to the Farmington Valley Greenway. Some faculty/staff commented saying it is too far to bike and there is no safe route. Several students and faculty/staff have said they do not own a bike.

Other responses to the survey were that many students did not know where to find information about the bus and shuttle schedules. The link to Rideshare on the CCSU website is broken and did not have information. A couple students work off campus right after school. A couple faculty/staff members say they have off campus meetings. A few comments were to have a better sidewalk to Stop and Shop.

Moving Forward

The survey indicates that while the majority of students and faculty/staff drive to campus, there is an opportunity to address the barriers identified in the campus surroundings to encourage the use of alternative transportation modes. For example, distance from campus was identified as an impediment, preventing respondents from walking and biking to/from campus. While this may be true for some respondents, if adequate infrastructure and additional supports are implemented, the distance may seem less of a barrier and students and faculty/staff may be more likely to walk and bike. Enhancements may include improved sidewalk connectivity, signalized crossings, improved lighting, and dedicated bike lanes and/or paths.

Flexibility is also a major concern of students. The need for a car in case of emergencies was cited by a large percentage of respondents for each mode of transportation. A “guaranteed ride home” program may do much to alleviate this concern. The university began a short-term car rental program (currently run by Hertz) in the Spring of 2013 and it is already proving to be a popular option. This program should be in place by Spring 2013.

Lastly, the survey revealed many respondents may be willing to car-pool to campus but few know about available carpools in their area. Education and promotion of existing carpool programs across the state may be beneficial to the campus community.

Appendix A: Additional data tables

Impediments to taking the bus	All students	Bus riders
Takes too long	42%	52%
No bus where I live	38%	7%
Need a car in case of emergencies	35%	23%
Too complicated (too many transfers)	33%	32%
Buses are unreliable/not on-time	30%	45%
Don't know how to use the bus	26%	0%
I feel unsafe waiting for/riding the bus	21%	5%
Buses do not run early or late enough	21%	39%
No bus where I work	16%	5%

Popularity of impediments to taking the bus: bus riders compared to all students

Impediments to walking	All students	Walkers
School is too far from home	66%	14%
Work is too far from school	35%	12%
Need a car in case of emergencies	28%	17%
No convenient routes	19%	12%
Insufficient lighting at night	18%	20%
Crime	17%	13%
Sidewalks and street crossings are unsafe/missing	16%	18%

Sidewalks not maintained in winter	13%	20%
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Popularity of impediments to walking: walkers compared to all students

Impediments to biking	All students	Bicyclists
School is too far from home	58%	0%
Work is too far from school	31%	17%
Need a car in case of emergencies	28%	0%
No bike lanes or paths	25%	33%
Roads are unsafe	22%	17%
Too much traffic	21%	0%
Roads/sidewalks not maintained in winter	19%	17%
Insufficient lighting at night	19%	17%
No safe place to leave my bike	16%	0%
Cars go too fast	15%	17%
Lack of showers/changing facilities on campus	11%	33%

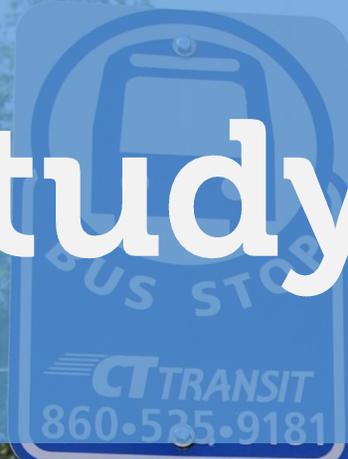
Popularity of impediments to biking: bicyclists compared to all students

Impediments to carpooling	All students	Carpoolers
Need a car in case of emergencies	30%	17%
No carpools where I live	30%	14%
Need to work after school	29%	3%

Don't know where to find one	27%	17%
Too much time spent waiting on/picking up others	25%	17%
Existing carpools don't match my schedule	24%	14%
I feel uncomfortable riding with strangers	23%	7%

Popularity of impediments to carpooling: carpoolers compared to all students

Bus study



Stanley Street

Century 21
All Agents' Realty
860.631.8378

Introduction

After conducting a survey of student transportation choices, CCRPA began a study of bus ridership to better understand the dynamics of transit use around CCSU. The study was designed to determine how many people are riding CTTRANSIT buses that serve the campus, where they get on, and where they get off. It also looked at on-time performance and analyzed the potential CCSU-based ridership of the system. The results of the study will inform public transit planning decisions, help determine where resources should be dedicated, and help assess the potential for future ridership gains. The study also sought to answer the same questions for the campus shuttle, which nearly duplicates one of the CTTRANSIT bus routes.

Service

CCSU is directly served by three bus routes operated by two different organizations. Routes O and S and part of the New Britain system and are operated by New Britain Transit. Route 69 is part of the Hartford system and is operated by CTTRANSIT Hartford. All of these routes provide weekday and Saturday service, though none of them have Sunday service.

The O and S routes are mostly confined to New Britain. They both serve the northern portion of New Britain, between downtown and the Westfarms Mall area in Farmington. CCSU is roughly the mid-point. Transfers to more expansive routes are available at Westfarms and downtown.

Route 69 provides greater reach. It travels between Downtown Hartford and CCSU. Riders can get to Newington, West Hartford, and Hartford.

Service on all three routes is hourly. Route 69 buses leave Downtown Hartford at 10 after the hour starting at 6:10am, then switch to 50 after the hour at 4:50pm. The last bus leaves Downtown Hartford at 6:35pm. Route S buses depart Downtown New Britain thirty minutes after the hour on an hourly schedule. They begin serving CCSU at 5:45am. Buses arrive forty minutes after the hour. Route O buses begin serving CCSU at 7am, departing Downtown New Britain hourly until 6:00pm. They arrive at CCSU forty minutes after the hour. Both the O and S buses serve CCSU twice per run, once on the way to Westfarms and once on the way back. At 6:30pm, the O and S buses combine and depart Downtown New Britain thirty minutes after the hour until 10:30. The last bus that serves CCSU arrives at 10:25pm.

Potential ridership

A database of student addresses was obtained and used to analyze the potential ridership of the bus system. Using ArcGIS, a half-mile

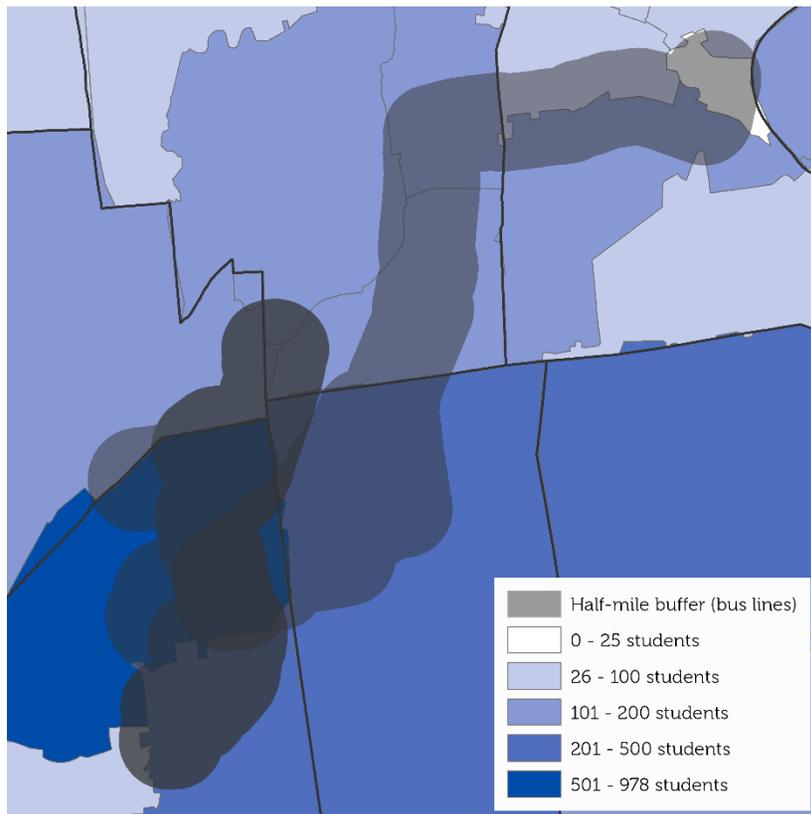


Figure 9. Students per zip code with half-mile bus line buffer

buffer was drawn around the three bus lines serving the campus. The number of students living within that buffer was then calculated. A total of 1,339 students (not counting the resident population) live within walking distance of one of the three bus routes. Potential ridership for each of the three bus routes is detailed below.

In the future, CTFASTRAK, a bus rapid transit (BRT) line being constructed between New Britain and Hartford, will provide faster, more frequent service to the CCSU campus. The same analysis was performed on the proposed route to determine its potential student ridership. The result was that 624 students live within a half mile of the route.

This analysis does not take into consideration a number of factors. It assumes that students will only take a “one seat” ride (that is, no transfers). It also assumes that students will be walking to the stations, not driving or riding a bicycle. If students are more flexible, the potential ridership could increase dramatically. As shown below,

Route	Students within a half mile
Existing combined	1,339
Future: CTFASTRAK	624
All Hartford/New Britain routes	8,988

Figure 10. Potential ridership

8,988 students live within a half mile of a bus route in the Hartford and New Britain service areas. Many of these buses, however, would entail excessively long commute times and numerous transfers.

Current ridership

Only 4% of students report taking the bus on a regular basis, but they represent a large portion of current bus riders. During a typical week, between 11% and 14% of riders board the Route S bus at CCSU; between 5% and 8% of riders alight at CCSU. The university was less popular with Route O riders; just 4-8% of riders board, and 7-10% of

riders alight, at CCSU. On the Route 69, however, 8-17% of riders get on and 11-17% get off at CCSU.

Ridership is relatively spread out during the week. The most popular days to ride the bus are Tuesday and Thursday, with Monday and Wednesday following close behind. Fridays see few riders as there are few classes offered.

As expected, ridership is greatest in the mornings and the late afternoons/early evenings. The initial runs, around 7am see the highest ridership at CCSU, followed by reduced, but steady ridership in the late morning and early afternoon. Starting in the late afternoon,

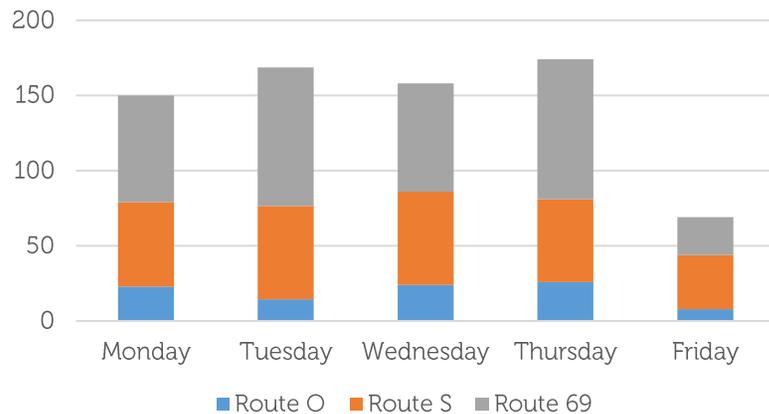


Figure 12. Boarding at CCSU by day

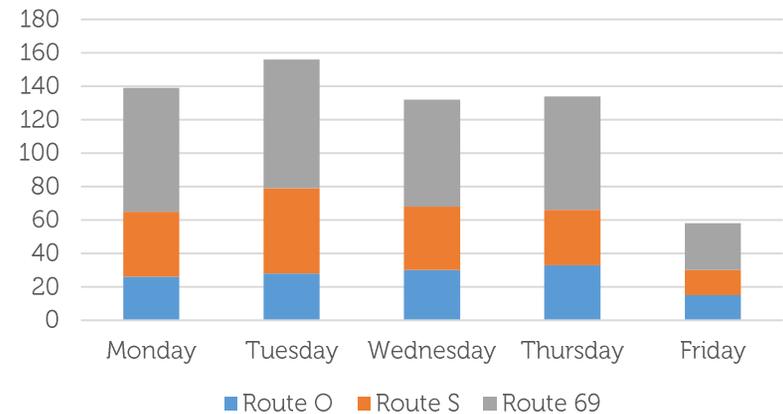


Figure 11. Passengers alighting at CCSU by day

around 3pm, ridership starts to increase again before trailing off around 8pm. On the O and S, which run until 9pm, ridership is steady until the last run.

On-time performance

One of the biggest complaints from actual bus riders responding to our survey (see Transportation Survey above) was that buses are unreliable. To test that, CCRPA staff recorded arrival times at CCSU as they rode the bus using automated GPS units. The results show a wide variation in arrival times with some instances of buses being excessively late or excessively early. While early arrivals are not necessarily a problem for riders, they do indicate that increased efficiencies could be achieved through modifications to the route or schedule. Any such changes should be carefully weighed against the benefits of a regular schedule and route.

Route S

On average, Route S buses travelling northbound (toward Westfarms Mall) had the worst on-time performance of the three bus routes serving CCSU. The average deviation from the scheduled arrival time was 4.5 minutes. Just 16% of arrivals were on-time or early while

86% were late. The average late arrival was 4.6 minutes late. The latest arrival time was 16 minutes late and the earliest was 19 minutes early. The wide variation suggests that not all late arrivals are that severe. Digging deeper we find that 30% of arrivals were at least five minutes late.

Southbound buses had better on-time performance, but still worse than the other routes. The average deviation was 3.4 minutes and the average late arrival was four minutes. The highest late arrival time was nine minutes late. The majority of arrivals, nearly 80%, were late, but only 17% were late by at least five minutes.

After 6pm, routes O and S combine into the OS bus. For the purposes of this analysis, we combined the OS data into the S data. When the OS data is separated out, on-time performance for the S bus becomes slightly worse, with 35% of buses arriving at least five minutes late.

Route O

The northbound O bus had the most reliable on-time performance in our study. The average deviation was just 1.8 minutes. The average late arrival was just 2.1 minutes and the average early arrival was just 2.1 minutes. The maximum late arrival occurred just four minutes off

schedule. Just 40% of arrivals were late and none of them were more than five minutes late.

The southbound O bus was slightly less reliable than the northbound route, but still acceptable. The average deviation was just 2.1 minutes with a relatively low late arrival average of just 1.5 minutes. The maximum late arrival was just three minutes off schedule. Just 11% of arrivals were late and none were more than five minutes late.

Route 69

The route 69 only arrive at CCSU in one direction, as CCSU is its endpoint. Just 38% of trips were late at all, and only 7% were late by more than five minutes. The average deviation was 3.6 minutes and the average late time was 4.1 minutes. Approximately 52% of arrivals were early by an average of 3.6 minutes. The latest and earliest buses were each off by 12 minutes.

On-time performance analysis

With the exception of route S, few reliability problems were encountered. Both the O and 69 showed very good reliability. The problems with route S appear to stem from ridership patterns. The O and S buses are “flag down” systems. That is, riders can get on and off at any point along the route. Analyzing stop frequency shows that S

buses stop much more often. The average number of stops per mile during the study period was 1.56. On the O the average was 1.27 and on the 69 it was 1.36. The difference between the O and the S was 22%. The increased stop frequency is the likely cause of the worse on-time performance.

Campus Shuttle

Like the public buses that serve CCSU, a study was completed on the campus shuttle to determine ridership counts, efficiency of service, and whether or not there is a demand for this service on campus. CCRPA riders began the data collection on the shuttle in downtown Hartford, counting passengers along the way until the route terminates on campus. Normally, the scheduled route for the shuttle also makes stops in downtown New Britain at the ITBD Building and the Westfarms Mall, although this was not always the case. During the study, there were many instances when these two stops were skipped over unless the driver was specifically asked to stop there.

Data collected during the study period reveals numerous reliability problems. Many times the shuttle was running up to twenty minutes behind schedule or leaving earlier from campus than scheduled. It was evident that the morning and afternoon driver altered the

shuttle schedule based on her experience of the route. This driver had given her cell phone number to the students who regularly ride the shuttle in case they wanted her to wait or to find out if it was running late. While this is a benefit to the regular riders, the fluctuating schedule may deter potential riders who are unaware of the inconsistent service.

Compared to the 69C bus, the campus shuttle has a much faster route between downtown Hartford and CCSU. Based on the study's data, it takes the shuttle between 15 and 20 minutes to arrive on campus coming from Hartford. The 69C takes approximately 40 minutes due to a higher ridership and more frequent stops. Although the shuttle takes less time, it offers a limited service of only six trips a day compared to the hourly service offered on the 69C. The campus shuttle duplicates the route already offered by the 69C bus, except for evening runs when the 69C is no longer in service. However, passenger counts collected on the shuttle reveal there is relatively low ridership during these evening hours.

The schedule for the shuttle does not correlate with class schedule on campus, the shuttle misses the peak class times when the most students are on campus. Students who need to arrive on campus during the peak class times at 9:25 am and 10:50 am would need to take the 7:15 am shuttle from Hartford. The next shuttle does not

	Weekly	Daily Average	Academic year
Rides	115	23	3,450

Table 13. Ridership levels of the CCSU shuttle

arrive on campus until 11:50, so students taking that 7:15 am shuttle would be getting to campus several hours before their class actually starts. The same situation occurs in the afternoon as well, students taking the shuttle would have to take a shuttle that arrives hours earlier than the peak class times.

Ridership

As shown in Table 13, in one week there was an average of 115 one way rides. Assuming that students use the shuttle to arrive to campus and also leave campus, there are 58 students that make round trip rides per week. The busiest time on the shuttle was at 7:15 am when the shuttle starts in downtown Hartford and arrives to campus by 8:00 am (see Table 14). Wednesday was found to be the busiest day of the week, and Friday had the fewest riders when the shuttle only runs three times compared to the normal six times.

Service costs

The study also finds that the shuttle costs more per ride than the CTTRANSIT service (see Table 15). The shuttle costs roughly \$20 per ride while the standard CTTRANSIT fare is \$1.35. Cheaper fares are available through the purchase of monthly passes (\$47 for an unlimited pass) and CTTRANSIT's UPass program (\$0.85 per ride). The UPass program provides students with a pass that provides an unlimited number of rides. The University is billed on a per ride basis, at \$0.85 per ride.

As shown below, if the 3,450 annual trips were shifted to CTTRANSIT buses, considerable savings would be realized. This analysis, however, assumes that ridership will remain stagnant. It is highly probable that ridership will increase under a discounted bus pass scenario. The \$63,000 spent on the shuttle service could provide 74,117 UPass rides on CTTRANSIT, or 46,666 rides with the regular CTTRANSIT fare.

Recommendations

The data collected as part of this study leads to a number of recommendations that are present in the CCSU Transportation Plan. They are as follows.

Replace the Campus Shuttle

Although, the shuttle does provide a valuable service for a few students, it is underutilized and has a low ridership. Phase out the campus shuttle and have students utilize the buses, because the CTTRANSIT buses make the same stops as the shuttle does and it is more reliable. This would save the school over \$60,000. CCSU would

Hour	Average Rides
7:00 AM	28.0
8:00 AM	0.5
10:00 AM	1.5
11:00 AM	11.5
12:00 PM	5.5
1:00 PM	10.5
2:00 PM	18.5
5:00 PM	0.5
6:00 PM	10.5
7:00 PM	9.0
9:00 PM	3.5
10:00 PM	7.5

Table 14. Average hourly rides on the shuttle

need to work with CTTRANSIT to extend the service times of the 69C bus to Hartford to cover the 7:50pm and 10pm shuttle runs.

Provide a UPass

Implement a University Pass (UPass) to students and faculty to ride the bus. The cost per-ride of CTTRANSIT’s UPass program is significantly cheaper than what CCSU currently pays for the shuttle. This would allow students to ride the bus for free and would provide a large discount to CCSU.

Conversion to fixed-stop system

Convert the O and S bus from a flag-down system to a fixed-stop system. A flag-down system allows anyone to get on the bus anywhere on the route, where as a fixed-stop system, will have the bus make stops at specific points along the route. This would reduce the number of stops that busses have to make and allow passengers to reach

	Shuttle	CTTRANSIT UPass	CTTRANSIT Regular
Per ride	\$20.00	\$0.85	\$1.35
Total Cost	\$63,000	\$2,932.50	\$4,657.50

Table 15. Cost comparison between CCSU operated shuttle and CTTRANSIT given current shuttle ridership

their destinations quicker. This conversion would save CTTRANSIT on gas, money, and would help the environment by reducing greenhouse gas emissions.

This project is already underway by CCRPA and ConnDOT. Signs are being installed throughout the New Britain system and will result in the system being converted to a fixed-stop system. To ensure that reliability does not become a concern, the number of stops should be limited. Current proposals are to have 119 stop. CCRPA recommends reducing that number to 70 stops. This should help improve on-time performance for Route S and prevent ridership increases from degrading performance on other routes.

Altering the 69C bus route

Currently, the 69C bus travels along Ella Grasso BLVD, turning left onto Stanley Street, and then turning left onto Paul Manafort Drive. The bus makes a stop on Stanley Street, across the street from campus which forces students to cross the street unsafely, because there are no crosswalks. Altering the 69C bus to go the opposite way around the campus would let passengers out in front of campus, without leaving them to cross the streets that have a high amount of traffic. Another recommendation to the 69C bus is to stop in front of the Student Center. The Student Center Circle was originally de-

signed for the city bus to come in and make stops, but it was never utilized. If the 69C were to enter the Student Center Circle, it would increase its visibility to students on campus.

Installing Crosswalks

Many of the bus stops to CCSU are across the street from campus. Students are forced to cross the street unsafely, because there are no cross walks. The streets that surround the campus have a high amount of traffic and many people drive faster than the 25mph speed limit that is posted. About 98% of cars that drive on Ella Grasso BLVD drive over 25mph. Many passengers that get off at CCSU on Stanley Street cross the road in front of Davidson Hall and the entrance to the Welte Parking Garage. Installing crosswalks and signs for pedestrians crossing will allow passengers to cross safely without being in danger of getting hurt on all the streets surrounding campus. ConnDOT is currently addressing these issues with the city of New Britain and the town of Newington.

Promoting the bus

Based on the responses from the survey given to the all the students and faculty, many of them had no knowledge of the buses that serve CCSU. Currently, there are no signs on campus to direct people

where any of the bus stops are located. There are signs near the bus shelter in front of Davidson Hall for the campus shuttle and 69C, but there are none for the O or S Bus. A recommendation is to add bus stop signs on Stanley Street to identify where the O and S bus make stops; and directional signs throughout campus that lead to bus stops. Another recommendation is to have an information kiosk in the student center that provides brochures of all the bus schedules, map of the transit system, and information on other transportation options at CCSU, and a place to purchase bus passes. Provide transportation information brochures for every resident and academic hall.

Upgrade bus shelters

There are two bus shelters located both on Stanley Street, one in front of Davidson Hall and another on the corner of Stanley and Eddy Glover Blvd. across the street from Maloney Hall. The bus shelter across from Maloney hall is fairly new, but needs improvements. Both of the shelters need to be updated, the benches need to be fixed, there is no lighting which is not safe at night, and they do not provide a map or schedule of the buses that make stops there. There should also be a bus shelter on Paul Manafort Drive, ideally near the Charter Oak parking lot, for when the 69C bus makes its way to the stops on that street.

Appendix A: Ridership data

Route S

Getting On (averaged over two-week equivalent)

Location	Monday		Tuesday		Wednesday		Thursday		Friday	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent
All	472	100%	437	100%	500	100%	509	100%	296	100%
Downtown	131	28%	118	27%	137	27%	147	29%	50	17%
CCSU	56	12%	62	14%	62	12%	55	11%	36	12%
Westfarms	123	26%	128	29%	127	25%	144	28%	61	21%

Getting Off (averaged over two-week equivalent)

Location	Monday		Tuesday		Wednesday		Thursday		Friday	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent
All	476	100%	438	100%	473	100%	488	100%	297	100%
Downtown	111	23%	100	23%	112	24%	110	23%	59	20%
CCSU	39	8%	51	12%	38	8%	33	7%	15	5%
Westfarms	95	20%	87	20%	95	20%	104	21%	73	24%

Route O

Getting On (averaged over two-week equivalent)

Location	Monday		Tuesday		Wednesday		Thursday		Friday	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent
All	289	100%	343	100%	335	100%	339	100%	202	100%
Downtown	74	25%	98	29%	94	28%	105	31%	68	33%
CCSU	23	8%	14.5	4%	24	7%	26	8%	8	4%
Westfarms	74	26%	93	27%	107	32%	89	26%	44	22%

Getting Off (averaged over two-week equivalent)

Location	Monday		Tuesday		Wednesday		Thursday		Friday	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent
All	277	100%	348	100%	325	100%	321	100%	201	100%
Downtown	43	16%	74	21%	80	24%	71	22%	52	26%
CCSU	26	9%	28	8%	30	9%	33	10%	15	7%
Westfarms	58	21%	81	23%	78	24%	74	23%	44	22%

Route 69

Getting On (averaged over two-week equivalent)

Location	Monday		Tuesday		Wednesday		Thursday		Friday	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent
All	566		629		504		558		329	
CCSU	71	13%	92	15%	72	14%	93	17%	25	8%

Getting Off (averaged over two-week equivalent)

Location	Monday		Tuesday		Wednesday		Thursday		Friday	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent
All	429		519		409		468		264	
CCSU	74	17%	77	15%	64	16%	68	15%	28	11%

Parking study



Introduction

As indicated in the surveys taken by students and faculty, the availability of parking was a common complaint among students. In response to this complaint, CCRPA initiated a campus-wide parking study to examine the issue. The study was designed to count each available parking space in all the parking lots and garages on campus at various times of the day. The results of this study will inform the university if a parking issue does exist, and more specifically which lots or garages lack parking. This parking audit will help the university develop strategies to mitigate issues in over utilized parking areas and alleviate complaints from students and faculty.

Study Results

Contrary to student and faculty perception, a lack of parking availability does not exist on campus. While students and faculty may have a difficult time parking in the more desired garages and lots, there are almost 1,000 free parking spaces at any given hour on campus. Even during the peak hour on campus, Thursday at 11:00 AM, 9% (428 spaces) of parking remained free. Copernicus Garage and Kaiser Lot were the top underutilized parking areas on campus. Table 16 shows

the average percent of spaces open for each parking area that was studied.

Parking areas with limited open spaces were usually located the closest to residence halls or academic buildings. Naturally, drivers tend to park closest to their destination in order to shorten their walk. Given the compact size of campus, the less desired parking areas at actually only a few minutes further away from buildings than the popular parking areas. The campus map below (see Figure 15) shows the average number of available parking spaces in each lot

	Open Spaces	Percent Available
Burritt Lot	4	2%
Copernicus Garage	552	34%
James Lot	0	0%
Kaiser Lot	150	31%
Student Center Garage	194	18%
Student Center Lot	9	7%
Vance Residence	1	2%
Welte Garage	144	14%
Welte Lot	3	2%
Willard	5	6%
Total	1062	22%

Table 16. Weekly Average Available Spaces

and garage throughout the week.

Parking areas were busiest during peak class times, around 11:00 AM, and experienced less of a demand as they day continued. During this time, parking areas like the Student Center Lot and Willard Lot experienced maximum parking capacity. Over the course of the study period, James Lot averaged at maximum capacity, with no available parking spaces. This lot serves five residence halls and is close to sev-

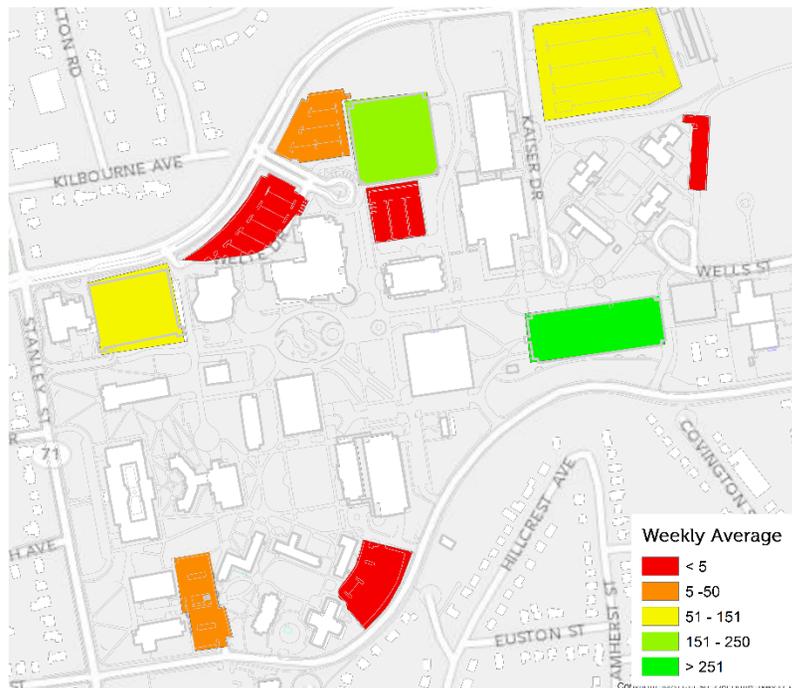


Figure 13. Weekly average available space by lot

eral academic buildings, creating a high demand for parking spaces. Vance Residence Lot also faced the same demand, serving four residence halls at the top of campus.

Parking audits were not conducted on Fridays as the university has fewer classes and therefore fewer people driving to campus. Vance Academic Garage was not included in this study as it is restricted parking for faculty only. All other garages and lots are available for student parking, including Welte which is card access only. The Willard and DiLoreto Parking Lot is designated for faculty until 5:00 PM when students are then permitted to park in the lot.

The map in Figure 15 shows available parking during the busiest hour on campus, Thursday at 11:00 AM. The majority of the parking areas on campus have limited parking availability, with the exception of Copernicus Garage, which had 345 available spaces.

During these peak hours on campus, observations indicated many drivers circling around packed lots and garages in an attempt to find an available space. Meanwhile, other areas on campus had hundreds of available spots. Students unwittingly spend more time circling these busy lots, perhaps without finding a space, than if they were to park elsewhere on campus.

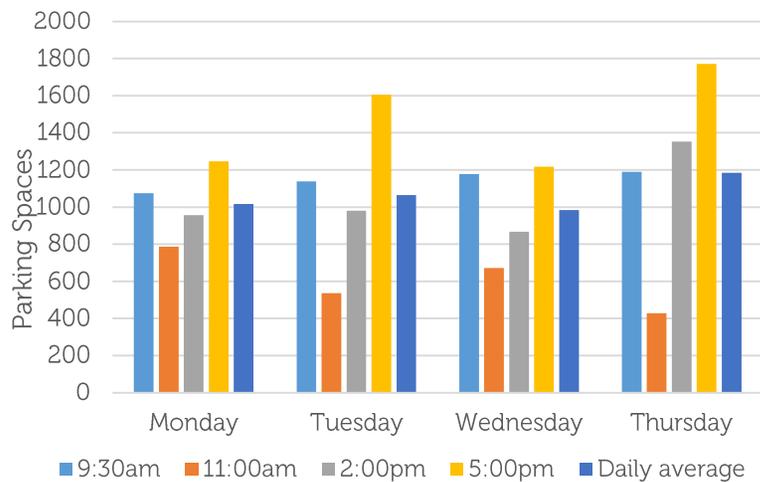


Figure 14. Parking spaces available by hour and by day

The chart in Figure 14 shows the number of available parking spaces in all the lots and garages during the four parking audits. Throughout the week, 11:00 AM had the least available parking, while 5:00 PM had the most available parking spaces. The availability is heavily affected by class scheduling at the university. Peak hours on campus are between 9:00 AM and 2:00 PM, when most students are registered for classes. Mondays and Wednesdays offer late evening courses, which accounts for less availability compared to Thursday evening. Complete data for the parking study is available in Appendix B: Parking data.

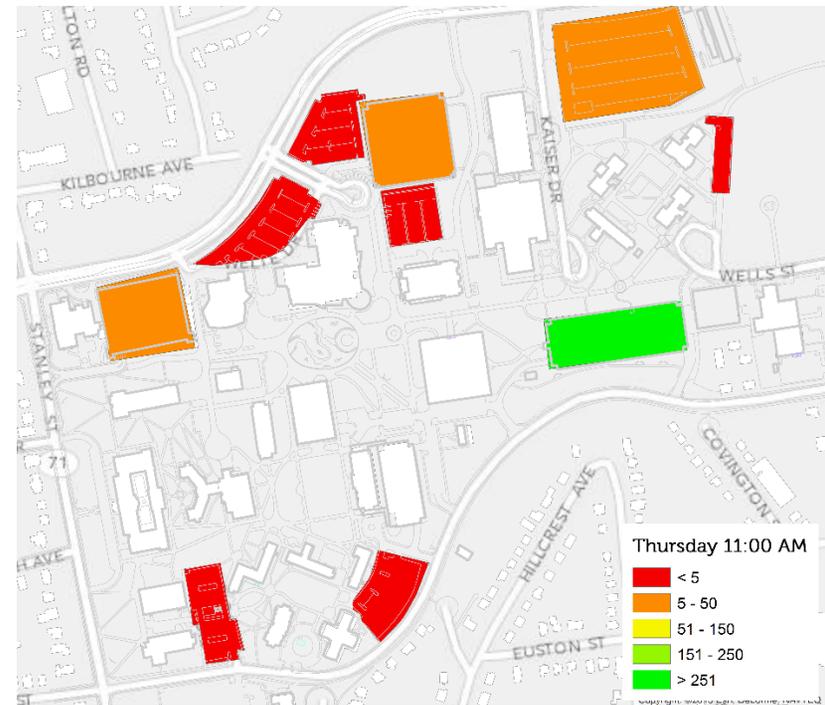


Figure 15. Spaces available on Thursdays at 11:00 AM

Conclusion

Data collected from this study reveals there is not a lack of parking on campus for students or faculty. Parking areas like Copernicus Garage and Kaiser Lot are largely underutilized. CCSU can take several initiatives to combat this false perception. CCSU has the advantage

that campus is relatively small and compact, and should focus their efforts on relaying this to students. Wayfinding signs can be installed throughout campus, directing students, faculty, and visitors to popular destinations along with the number of minutes it takes to walk there. Doing this will help those on campus realize that all parking garages and lots are within close walking distance to major academic and recreational buildings. Students will then be more likely to park in areas where spaces are almost always available, instead of wasting time circling the full areas.

Appendix B: Parking data

The following four maps depict parking availability on Thursdays as the day progresses.

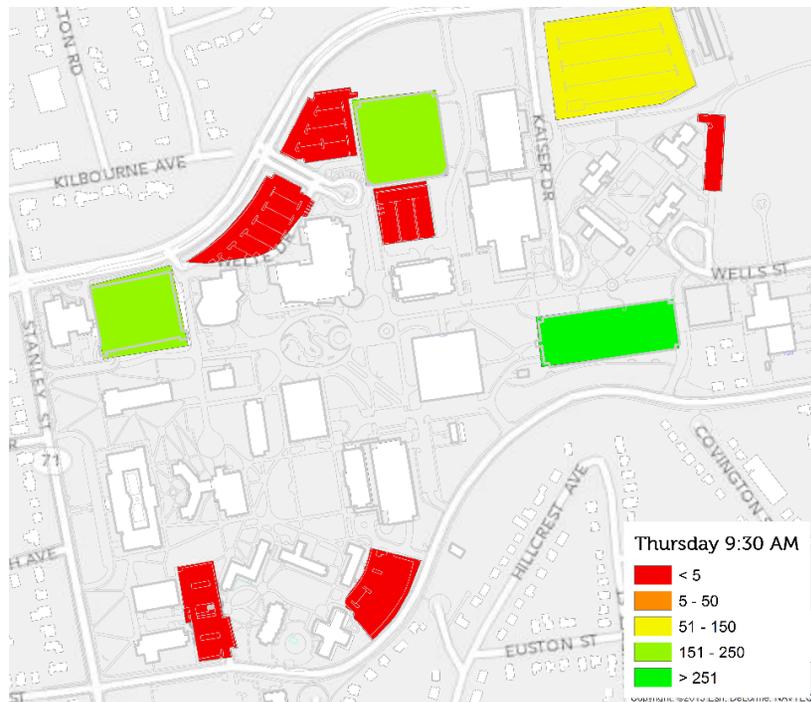


Figure 16. Parking availability on Thursday at 9:30 AM

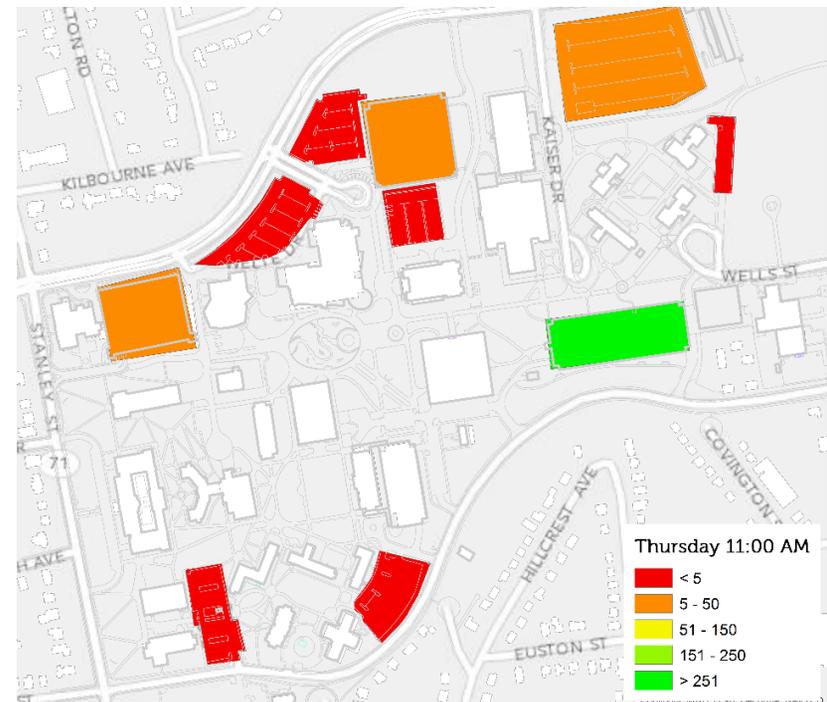


Figure 17. Parking availability on Thursday at 11:00 AM

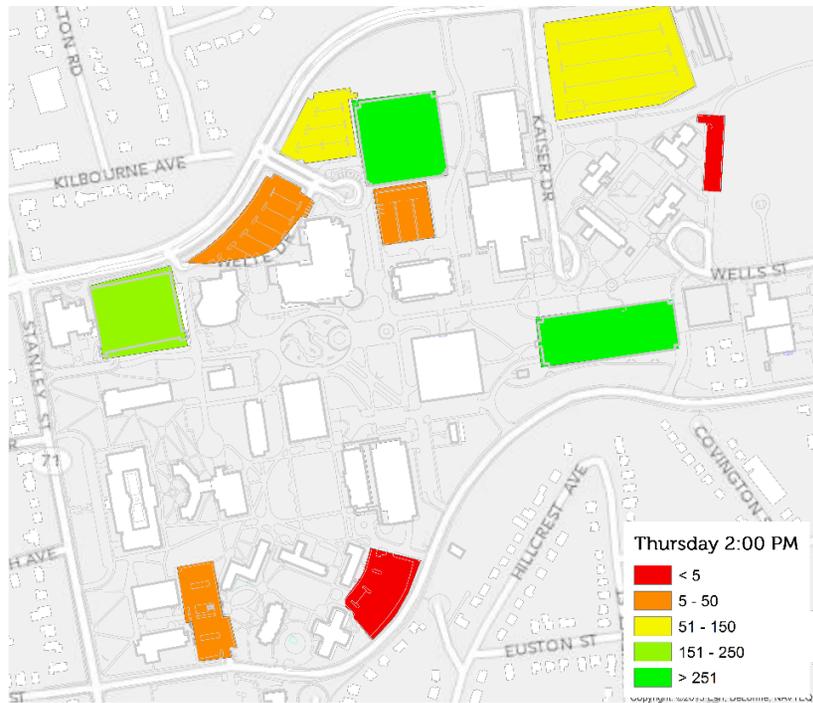


Figure 19. Parking availability on Thursday at 2:00 PM

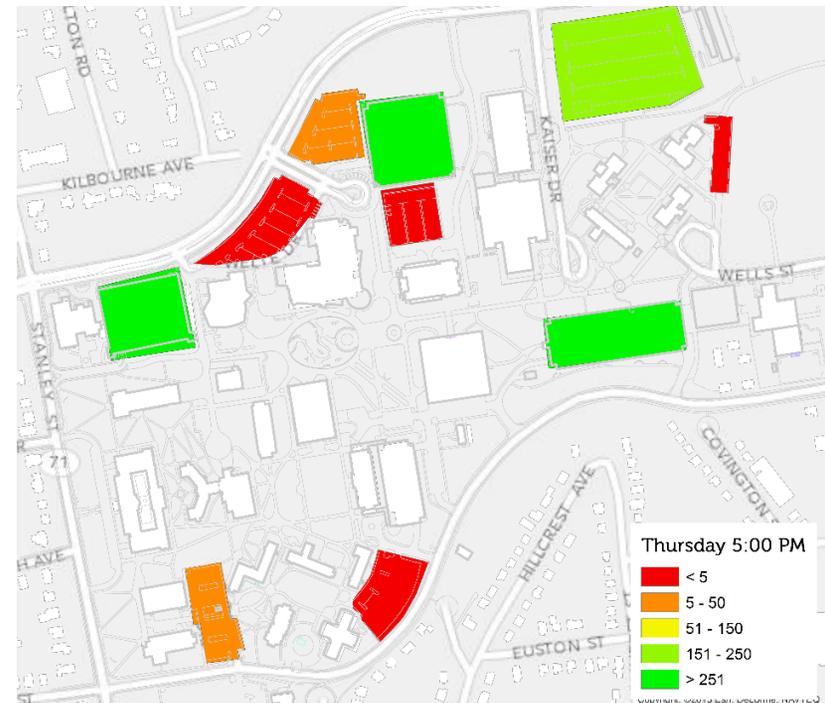


Figure 18. Parking availability on Thursday at 5:00 PM

Figure 20 Available Parking Spaces on Mondays

Garage	9:30am		11:00am		2:00pm		5:00pm		Daily average	
Burritt Lot	3	2%	0	0%	2	1%	9	6%	4	2%
Copernicus Garage	620	38%	523	32%	480	30%	521	32%	536	33%
James Lot	0	0%	0	0%	0	0%	0	0%	0	0%
Kaiser Lot	153	32%	132	27%	156	32%	213	44%	164	34%
Student Center Garage	141	13%	58	6%	158	15%	287	27%	161	15%
Student Center Lot	1	1%	0	0%	5	4%	6	5%	3	3%
Vance Residence	0	0%	0	0%	2	4%	1	2%	1	1%
Welte Garage	151	15%	72	7%	151	15%	199	20%	143	14%
Welte Lot	4	2%	2	1%	0	0%	0	0%	2	1%
Willard	2	2%	0	0%	2	2%	10	12%	4	4%
Total	1075	22%	787	16%	956	20%	1246	26%	1016	21%

Figure 21 Available Parking Spaces on Tuesdays

Garage	9:30am		11:00am		2:00pm		5:00pm		Daily average	
Burritt Lot	0	0%	0	0%	7	5%	13	8%	5	3%
Copernicus Garage	595	37%	385	24%	459	28%	710	44%	537	33%
James Lot	0	0%	0	0%	1	1%	4	3%	1	1%
Kaiser Lot	151	31%	74	15%	139	29%	198	41%	141	29%
Student Center Garage	208	20%	51	5%	252	24%	361	34%	218	21%
Student Center Lot	0	0%	6	5%	11	10%	16	14%	8	7%
Vance Residence	1	2%	3	6%	0	0%	0	0%	1	2%
Welte Garage	183	18%	14	1%	104	10%	265	27%	142	14%
Welte Lot	0	0%	2	1%	2	1%	17	9%	5	3%
Willard	0	0%	1	1%	6	7%	21	25%	7	8%
Total	1138	23%	536	11%	981	20%	1605	33%	1065	22%

Figure 22 Available Parking on Wednesdays

Garage	9:30am		11:00am		2:00pm		5:00pm		Daily average	
Burritt Lot	1	1%	0	0%	0	0%	5	3%	2	1%
Copernicus Garage	609	38%	499	31%	471	29%	543	34%	531	33%
James Lot	0	0%	0	0%	0	0%	0	0%	0	0%
Kaiser Lot	119	25%	146	30%	197	41%	186	39%	162	34%
Student Center Garage	222	21%	22	2%	135	13%	303	29%	171	16%
Student Center Lot	1	1%	1	1%	7	6%	10	9%	5	4%
Vance Residence	1	2%	0	0%	1	2%	2	4%	1	2%
Welte Garage	225	23%	3	0%	57	6%	150	15%	109	11%
Welte Lot	0	0%	0	0%	0	0%	2	1%	1	0%
Willard	0	0%	0	0%	0	0%	17	20%	4	5%
Total	1178	24%	671	14%	868	18%	1218	25%	984	20%

Figure 23 Parking Availability on Thursdays

Garage/Lot	9:30am		11:00am		2:00pm		5:00pm		Daily average	
Burritt Lot	0	0%	0	0%	16	10%	3	2%	5	3%
Copernicus Garage	657	41%	345	21%	669	42%	749	46%	605	38%
James Lot	1	1%	0	0%	0	0%	1	1%	1	0%
Kaiser Lot	129	27%	43	9%	135	28%	234	48%	135	28%
Student Center Garage	191	18%	12	1%	289	28%	407	39%	225	21%
Student Center Lot	0	0%	1	1%	53	46%	18	16%	18	16%
Vance Residence	2	4%	2	4%	1	2%	2	4%	2	3%
Welte Garage	209	21%	25	3%	160	16%	343	34%	184	18%
Welte Lot	0	0%	0	0%	23	12%	0	0%	6	3%
Willard	0	0%	0	0%	6	7%	14	16%	5	6%
Total	1189	24%	428	9%	1352	28%	1771	36%	1185	24%

