CAMPUS TRANSPORTATION SERVICE REPORT

Prepared by:
<table>
<thead>
<tr>
<th>Content</th>
<th>Page No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Executive Summary</td>
<td>2-3</td>
</tr>
<tr>
<td>Demographics</td>
<td>4-5</td>
</tr>
<tr>
<td><strong>Section 1: Overall Satisfaction of Campus Bus Services</strong></td>
<td>6-9</td>
</tr>
<tr>
<td>Are students satisfied with bus safety, accessibility of routes,</td>
<td></td>
</tr>
<tr>
<td>frequency and accuracy of bus applications?</td>
<td></td>
</tr>
<tr>
<td><strong>Section 2: Rider Habits of Campus Bus Services</strong></td>
<td>10-14</td>
</tr>
<tr>
<td>Which are the peak period of usage, and which bus stops do students</td>
<td></td>
</tr>
<tr>
<td>most frequent?</td>
<td></td>
</tr>
<tr>
<td><strong>Section 3: Overcrowding</strong></td>
<td>15-16</td>
</tr>
<tr>
<td>Is overcrowding on campus buses an issue?</td>
<td></td>
</tr>
<tr>
<td>When is this more prevalent a problem?</td>
<td></td>
</tr>
<tr>
<td><strong>Section 4: Usage of Express Shuttle Bus Services</strong></td>
<td>17-19</td>
</tr>
<tr>
<td>Are students aware of and utilising Express Shuttle Buses?</td>
<td></td>
</tr>
<tr>
<td>Does it cater to their needs?</td>
<td></td>
</tr>
<tr>
<td><strong>Section 5: Bus Services During Exam Periods</strong></td>
<td>20-24</td>
</tr>
<tr>
<td>Why do some students not opt to use campus buses during exam periods?</td>
<td></td>
</tr>
<tr>
<td>Which aspects of campus bus services can be improved during final</td>
<td></td>
</tr>
<tr>
<td>exam periods?</td>
<td></td>
</tr>
<tr>
<td><strong>Section 6: Seating and Waiting Time</strong></td>
<td>25-26</td>
</tr>
<tr>
<td>Will buses with larger standing capacity be a viable option in solving</td>
<td></td>
</tr>
<tr>
<td>overcrowding? Why do students not sit in buses, and what do they think</td>
<td></td>
</tr>
<tr>
<td>of current waiting times?</td>
<td></td>
</tr>
<tr>
<td><strong>Section 7: Information on Bus Services</strong></td>
<td>27-29</td>
</tr>
<tr>
<td>How effective are current platforms and avenues in relaying campus</td>
<td></td>
</tr>
<tr>
<td>bus services information?</td>
<td></td>
</tr>
<tr>
<td><strong>Section 8: Other Suggestions for Improvement</strong></td>
<td>30-32</td>
</tr>
<tr>
<td>Appendix: Sample of Survey Questions</td>
<td>33-44</td>
</tr>
</tbody>
</table>
Executive Summary

In Semester 1 of Academic Year 19/20, a total of 2,627 students participated in the NTU Campus Bus Services survey published by NTUSU’s Information and Research Committee from 23 October to 31 October 2019. The survey aimed to find out students’ satisfaction towards campus bus services in NTU, more specifically the three Campus Shuttle buses - Campus Red, Campus Blue and Campus Rider buses - as well as Express Shuttle Buses on weekdays.

The scope of the survey encompassed assessing students’ usage patterns of the various campus buses, including frequently used bus stops, peak rider hours. Feedback was also gathered regarding students’ satisfaction regarding various aspects of campus buses services - safety, accessibility, frequency of buses and accuracy of bus applications. Questions were also tailored to find out about Express Shuttle buses and buses during exam periods, to identify areas of improvement.

Regarding overall satisfaction levels, students were generally satisfied with bus safety, accessibility and accuracy of shuttle bus locations. However a larger proportion of respondents were dissatisfied or did not express satisfaction regarding campus shuttle bus waiting times and frequency, highlighting an area for further improvement. For about 4 in 10 students, bus timings are also “often” or “very often” longer than what they expect.

Peak periods of campus bus usage are at timings 0800-1000, 1600-1800 and 1800-2100. Further questions examined individual shuttle bus services and their most frequently used bus stops. For the Campus Red Shuttle Bus service, the most frequented bus stop is at at LWN Library, Opp NIE. For Campus Blue, students use the bus stop at NIE, Opp LWN library most. The most frequented Campus Rider bus stop is at Pioneer MRT Station at Block 649A. A more detailed breakdown of the statistics can be found in the respective section of this report.

Overcrowding on buses is a prevalent problem, with about 4 in 10 missing experiencing overcrowding on campus buses at least once a day. The timings at which students report experiencing overcrowding correspond to the peak usage hours, at periods 0800-1000, 1600-1800 and 1800-2100.

On the topic of Express Shuttle buses, a slight majority of respondents reported not using the Express Shuttle Bus services. Reasons for not using it include a lack of awareness of routes and operating hours, and that the routes do not cater to students’ destinations.

For campus bus services during final exam periods, or Exam Buses, about half of respondents selected campus shuttle buses as their preferred choice of transport to exam venues. Students who did not select campus buses preferred alternative transport options, with the top reasons being campus buses are unreliable, and that campus buses are too crowded to board.

Of those who have previously used exam buses, respondents rated bus stops as accessible to their exam venues. However, a rather large proportion of students are not satisfied with the frequency of buses during exam periods. Out of the 1310 respondents, 4 in 10 gave a satisfaction score of 1 or 2 out of a 5-point scale, indicating that they feel bus frequency should be improved. An overwhelming majority of students felt that a reasonable frequency of buses during exam periods is 5 minutes or less.
Regarding applications that provide information on NTU bus services, students think that they are quite informative, but gave suggestions to improve the accuracy of bus timings, include the type of bus service (normal/express), and if the buses are terminating at a certain location.

Other feedback surrounding safety included concerns over overcrowding, speeding, sudden braking and that the bus door would close while people are still boarding. Students also gave feedback to improve campus bus waiting times, especially increasing frequency during peak hours and reducing bunching of buses.
Demographics

A total of 2,627 students participated in the NTU Campus Bus Services survey published by NTUSU’s Information and Research Committee from 23 October to 31 October 2019. The survey aimed to find out students’ satisfaction towards campus bus services in NTU, more specifically the three Campus Shuttle buses - Campus Red, Campus Blue and Campus Rider buses - as well as Express Shuttle Buses on weekdays.

Of the total 2,627 students, 2617 NTU students responded to the survey, with the remaining 10 being exchange students. Out of all survey respondents, 30.9% were Year 2 students, 29.1% were Year 1 students, 22.1% were Year 4 students and 17.6% were Year 3 students.
Figure 1: Distribution of survey respondents across faculty
SECTION 1: OVERALL SATISFACTION OF CAMPUS BUS SERVICES

This section is addressed by the following questions:

Q1. Rate your overall satisfaction toward the following aspects of campus bus services.
   a) Safety
   b) Accessibility (ie. To what extent do the current bus routes cater to your destination?)
   c) Frequency/Waiting Time
   d) Accuracy of campus bus locations on bus applications
      (eg. U-Wave app)

Rationale
Q1. Was asked to find out how students felt towards various aspects of campus bus services, and if it met their expectations. This would allow us to gauge which aspects of campus bus services would require greater area for improvement.

Findings:
Q1.

Out of 2627 students surveyed, more than half are satisfied (45.8%) and very satisfied (18.7%) with their safety while riding on campus shuttle buses while a quarter were neither satisfied nor dissatisfied. Only a minority of respondents are not satisfied with safety (10%) while riding on campus shuttle buses.
Similar to Safety, more than half the surveyed students are satisfied (42.3%) or very satisfied (16.2%) with the accessibility of campus bus services. Slightly more than a quarter of students are neither satisfied nor dissatisfied with campus bus accessibility. A larger minority of students are dissatisfied or very dissatisfied with bus accessibility (15.4%).
Figure 4: Satisfaction levels of students with regards to the frequency and waiting time for campus shuttle buses

From the surveyed student population, **more than half the students are dissatisfied (33.2%) or very dissatisfied (20.2%)** with the frequency and waiting time of campus buses. 32.5% of surveyed students are neither satisfied nor unsatisfied with the bus waiting times while **only a minority of students are satisfied or very satisfied (14.2%)** with the bus frequency.
Figure 5: Satisfaction level of students with regards to the accuracy of shuttle bus location on mobile applications (i.e. NTUGo!)

About a third of surveyed students are satisfied (31.3%) or have no opinion (31.4%) on the accuracy of shuttle bus locations on mobile applications, with a minority being very satisfied (8.7%) with the accuracy of bus location on mobile apps. Slightly more than a quarter of students are dissatisfied (21%) or very dissatisfied (7.8%) at the accuracy of shuttle bus locations on mobile apps.
SECTION 2: RIDER HABITS OF CAMPUS BUS SERVICES

This section is addressed by the following questions:

Q2. Which timing(s) do you usually take the campus bus? Select all options that apply.

Q3. Which stops do you usually board and alight the campus bus most frequently? (a labelled map was also provided)
   - Campus Red
   - Campus Blue
   - Campus Rider

Rationale

Q2 Was asked to find out the trends in usage of campus shuttle buses.
Q3 To know which bus stops are most frequently used across Campus Red, Campus Blue and Campus Rider bus services.

Findings:

Q2.

![Figure 6: Timings at which students use NTU campus buses](image)

The peak periods whereby most students use the campus buses are at timings 0800-1000, 1600-1800 and 1800-2100. The busiest time is from 0800-1000 with 1590 (60.5%) of respondents using the bus, followed by 1600-1800 with almost half of respondents using the bus in that period.

More than 40% (more than 1100) of the students use the bus in the evening between 1600 and 2100 hours. Almost 39.5% respondents use the bus between 1000 and 1200 hours. In the time slots 1400 –
1600 hours and 2100-2300 hours, a fewer number of students (24.9% and 19.3% respectively) are using the campus bus service. There is a small fraction of students (119 students) that do not use the campus bus at all.

Q3.

Figure 7: Campus Red bus stops which students use most frequently

<table>
<thead>
<tr>
<th>Stop Description</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>R5: LWN Library, Opp NIE</td>
<td>60.7%</td>
</tr>
<tr>
<td>R9: Yunnan Park</td>
<td>25%</td>
</tr>
<tr>
<td>R12: Food Court 2</td>
<td>21.9%</td>
</tr>
<tr>
<td>R1: Hall 11</td>
<td>19.5%</td>
</tr>
<tr>
<td>R3: Nanyang Crescent Hall</td>
<td>17%</td>
</tr>
</tbody>
</table>

60.7% R5: LWN Library, Opp NIE 1594 responses
25% R9: Yunnan Park 656 responses
21.9% R12: Food Court 2 576 responses
19.5% R1: Hall 11 513 responses
17% R3: Nanyang Crescent Hall 447 responses
On the Campus Red Shuttle Bus service, a total of 1594 (60.7%) respondents report they use the bus stop at LWN Library, Opp NIE most frequently. This is followed by the bus stop at Yunnan Park, with 25% of respondents selecting that. The bus stop at Food Court 2 is used most frequently by 21.9% of respondents.

Figure 8: Campus Blue bus stops which students use most frequently

<table>
<thead>
<tr>
<th>Bus Stop</th>
<th>Frequency</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>B3: NIE, Opp. LWN Library</td>
<td>50.3%</td>
<td>1321 responses</td>
</tr>
<tr>
<td>B6: Opp. SPMS</td>
<td>31.5%</td>
<td>830 responses</td>
</tr>
<tr>
<td>B7: Opp. Yunnan Park</td>
<td>20.4%</td>
<td>536 responses</td>
</tr>
<tr>
<td>B11: Opp. Hall 10 &amp; 11</td>
<td>19.6%</td>
<td>514 responses</td>
</tr>
</tbody>
</table>

Figure 8: Campus Blue bus stops which students use most frequently
A total of 1321 (50.3%) respondents report they use the bus stop at NIE, Opp LWN library most frequently on the Campus Blue Shuttle Bus service. This is followed by the bus stop Opp SPMS, with 31.6% respondents using that frequently. The bus stop Opposite Yunnan Park is third, being used most frequently by 20.4% of respondents.

Figure 9: Campus Rider bus stops which students use most frequently
A total of 1464 (55.7%) respondents use the Campus Rider bus stop at Pioneer MRT Station at Block 649A most frequently. This is followed by the bus stop at TCT LT Opp Admin Building, with 43.3% respondents using that frequently. The bus stop at Student Service Centre is third, being used most frequently by 25.4% of respondents. On another note, 29% of respondents reported they do not frequently use any of the Campus Rider bus stops.
SECTION 3: OVERCROWDING

This section is addressed by the following questions:

Q4. On average, how often do you miss the bus due to overcrowding?

Q5. At which timing(s) have you experienced overcrowding? Select all options that apply.

Rationale

Q4. To find out if overcrowding is a prevalent issue, and if there is a need for a higher frequency of buses.

Q5. Was asked to find out the timings at which more bus services may need to be deployed if there is overcrowding.

Findings:

Q4.

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>More than once a day</td>
<td>23.6%</td>
</tr>
<tr>
<td>Once a day</td>
<td>21.9%</td>
</tr>
<tr>
<td>More than once a week</td>
<td>25.6%</td>
</tr>
<tr>
<td>Once a week</td>
<td>15.9%</td>
</tr>
<tr>
<td>Rarely</td>
<td>11.3%</td>
</tr>
<tr>
<td>Never</td>
<td>1.6%</td>
</tr>
</tbody>
</table>

Figure 10: Frequency of students missing buses due to overcrowding

More than a quarter of respondents missed the campus bus more than once a week due to overcrowding (25.6%), while almost a quarter miss the bus more than once a day due to overcrowding (23.6%). Another 21.9% of respondents miss the bus once a day due to overcrowding.
Out of the 2627 respondents, 63.5% students experience overcrowding during morning hours from 0800 – 1000 hours, making it the busiest hours for the campus buses. This is followed by the time slots 1600-1800 hours and 1800-2100 hours at which 48.7% and 43.6% respectively of students find the buses overcrowded. This trend corresponds to our findings in Q2 of the peak periods at which students take the campus shuttle buses.

Between 1000 - 1200 hours and 1200 - 1400 hours, fewer students (26.1% and 22.6% respectively) feel that campus buses are overcrowded. Around 10% of our respondents feel the bus is overcrowded during the timeslots 1400 – 1600 hours and 8% of them find it overcrowded between 2100 – 2300 hours. A small faction of people (1.9%) do not find the bus overcrowded at any time of the day.
SECTION 4: USAGE OF EXPRESS SHUTTLE BUS SERVICES

This section is addressed by the following questions:

Q6. Do you use the Express Shuttle Bus services?
Includes Red/Blue Loop Express, Lunch Express and Campus Rider Express buses

Q7. From Q6, yes: On average, how frequently do you use the campus express shuttle bus service?

Q8. From Q6, no: Why do you not use the express bus services?

Rationale
Q6. Was asked to find out the extent at which Express Shuttle Buses services are utilised.
Q7. To find out the frequency of usage of Express Shuttle Buses.
Q8 To find out reasons for students not utilising the Express Shuttle Bus services.

Findings:
Q6.

Usage of Express Shuttle Buses

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Q7.

Out of the 1212 students who answered “Yes” for the question 6, almost half of them (44.5%) claimed that they use the express shuttle bus service more than once a week. While 38.7% of the students, 469 of them use the service once a week, there are only 189 students (15.6%) who use the service once a month. 15 students (1.2%) said they have never used the service.

Q8.

For the 1415 students who answered “No” for question 6, more than half of them (57.3%) do not use the express shuttle bus service because the bus service does not cater to their destination. 399 students
(28.2%) are not aware of the service provided and 122 students (8.6%) prefer alternative transport options. 83 students (5.9%) do not use the express shuttle bus service due to other reasons.

The majority of responses for “Other” reflect that students have not come across Express Buses before, or the timings are incongruent to the timings that they take the campus buses. Others expressed that they do not know how Express Buses work, which may mean there is a need for greater awareness and publicity of Express Bus timings and routes.

Selected quotes are as follows:

<table>
<thead>
<tr>
<th>Reasons for not using Express Buses</th>
<th>Quotes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Confusion regarding the type of bus</td>
<td>“Too confusing.. sometimes the bus has the express placard shown but it goes the normal route.. so idk if the bus is express or not. Sometimes making me miss the bus bc I think it’s express but actually it’s not.”</td>
</tr>
<tr>
<td></td>
<td>“I do not know which buses are express.”</td>
</tr>
<tr>
<td>Lack of awareness of how the Express Bus operates</td>
<td>“Idk how it works.”</td>
</tr>
<tr>
<td>Incongruent usage timings with Express Bus operating hours</td>
<td>“Just not travelling during that time mostly in classes or already at destination.”</td>
</tr>
<tr>
<td></td>
<td>“I never see it around.”</td>
</tr>
</tbody>
</table>
### SECTION 5: BUS SERVICES DURING EXAM PERIODS

This section is addressed by the following questions:

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q13. What is your preferred choice of transport to your exam venue during final exam periods?</td>
<td>Campus buses&lt;br&gt;Public buses (179/199)&lt;br&gt;Private transport (Car/Cab)&lt;br&gt;Walking&lt;br&gt;Others</td>
</tr>
<tr>
<td>Q14. From Q13, any option other than “Campus buses”: Why are campus buses not your preferred choice in reaching your exam venue?</td>
<td>Inconvenient&lt;br&gt;Buses are usually too crowded to board&lt;br&gt;Long waiting time&lt;br&gt;Bus service is unreliable&lt;br&gt;Other: _______</td>
</tr>
<tr>
<td>Q15. Have you taken any campus buses during the final exam period? First year students please select &quot;No&quot;</td>
<td>Yes&lt;br&gt;No</td>
</tr>
<tr>
<td>Q16. Rate the accessibility of the nearest bus stop to your exam venues. i.e. walking distance from bus stop to exam venue</td>
<td>1-5 scale&lt;br&gt;Very far - Moderate - Very Near</td>
</tr>
<tr>
<td>Q17. How satisfied are you with the frequency of buses during final exam period?</td>
<td>1-5 scale&lt;br&gt;Very Dissatisfied to Very Satisfied</td>
</tr>
<tr>
<td>Q18. During final exam periods, what would you consider a reasonable frequency for campus buses?</td>
<td>5 min or less&lt;br&gt;6 to 10 min&lt;br&gt;11 to 15 min&lt;br&gt;More than 15 min</td>
</tr>
</tbody>
</table>

**Rationale**

Q13 Was asked to find out if campus buses are the preferred choice of transport during exam periods.

Q14 To understand the reasons students may prefer alternative transport options over campus buses. These also serve to inform how campus bus services may be improved especially during exam periods.

Q15 To ask more specific questions pertaining to exam bus services only to students who have the prior experience taking the buses.

Q16 Was asked to find out if bus stops are convenient for accessing exam venues.

Q17 To find out if bus services are sufficiently frequent during exam periods. This is to gauge if more campus buses need to be deployed during exam periods.

Q18 Was asked with the purpose of identifying what students deem as a reasonable waiting time for a bus during exam periods.

**Findings:**

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What is your preferred choice of transport to your exam venue during final exam periods?

- Campus shuttle buses (48.38%)
- Public buses (179/199) (22%)
- Private Transport (Car/Cab) (6.47%)
- Walking (22.31%)
- Others (0.84%)

48.4% of students use campus buses to go to their exam venues.

Figure 12: Students’ preferred choice of transport during finals exam period
Q14.

Why are campus buses not your preferred choice in reaching your exam venue?

![Pie chart showing reasons for choosing alternative transport options]

**Figure 13: Reasons for students choosing alternative transport options over campus buses**

During finals exam periods from the end of April to May, and end November to December, **almost half of students (48.4%) will opt to take campus buses to their exam venue.** This is followed by about a fifth of students (22.3%) preferring to walk and using public bus services (22.0%).

The most frequently given reason that students prefer to use alternative modes of transport over campus buses is that **campus buses are unreliable (32.2%) or too crowded to board (31.6%).** Others reported long waiting times (24.3%) as the reason for using other means of transport to their exam venue.

Q15.

<table>
<thead>
<tr>
<th>Survey Response</th>
<th>Percentage</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>50.1%</td>
<td>1317</td>
</tr>
<tr>
<td>Yes</td>
<td>49.9%</td>
<td>1310</td>
</tr>
</tbody>
</table>

**Figure 14: Students who have previously used campus buses during exam periods**

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Q16.

Figure 15: Accessibility of the nearest bus stop to students’ exam venues

Q17.

Figure 16: Level of satisfaction with bus frequency during exam periods
Q18.

To ensure more accurate answers are obtained, only the 1310 students who have previously used campus buses during exam periods could answer questions 16, 17 and 18.

Slightly more than half of the students surveyed (50.1%) have not taken the campus bus during exam periods before. This may be because 29.1% of respondents are Year 1 students, and have not yet had exams in NTU prior to this survey.

Most students feel that the bus stops are accessible to their exam venues. 29.7% of respondents rated accessibility at 4 or 5, and feel that bus stops are near to their exam venue, while 55.1% felt the distance is moderate.

However, a rather large proportion of students are not satisfied with the frequency of buses during exam periods. Out of the 1310 respondents, 40.0% gave a satisfaction score of 1 or 2, indicating that they feel bus frequency should be improved. Another 43.0% opted for a score of 3, and were moderately satisfied with the frequency of buses during exam periods.

Lastly, an overwhelming majority of 71.3% of students (934) felt that a reasonable frequency of buses during exam periods is 5 minutes or less. This is followed by 25.8% who felt that waiting 6 to 10 minutes is reasonable.
SECTION 6: SEATING AND WAITING TIME

This section is addressed by the following questions:

Q9. How frequently are bus timings longer than what you expect?
Q11. How often do you get a seat on the campus bus?
Q12. From Q11, “Sometimes” or “Rarely”: Why do you not sit on the bus?

Rationale
Q9 To find out if bus waiting times are aligned with students’ expectations, and to assess if there is a need for improvement of bus timings.
Q11 Was asked to assess if buses with more standing capacity would be a viable option, based on how frequently students get a seat on campuses buses currently.
Q12 To find out the reasons why students do not sit in campus buses or opt not to sit in buses.

Findings:
Q9.

![Graph showing the frequency of bus timings being longer than expectations]

Out of the 2627 students surveyed, *slightly less than half of the students* (46.8%) feel that the bus timings are *very often/often* longer than what they expect while *less than a quarter of the students* (21%) feel that the bus timings are *seldom/rarely* longer than what they expect. About *one-third of the students* (32.2%) feel that the bus timings are just about what they expect of it.
Q11.

The majority (61.9%) of respondents claimed that they were sometimes able to secure a seat. There are significantly more respondents who were able to secure a seat on rare occasions compared to those who were able to do so most of the time (24.4% vs 13.7%).

Q12.

This question asked the survey respondents about why they do not sit in the campus buses. The question is asked only to the survey respondents who answered “Sometimes” or “Rarely” in question 11 (2266 respondents). Most of the survey respondents claimed that the campus buses were too crowded (90.5%). A small portion of respondents said that their destination was too close (4.9%), followed closely by respondents who said that standing was more convenient (4.6%).
SECTION 7: INFORMATION ON BUS SERVICES

This section is addressed by the following questions:

Q19. Prior to this survey, have you heard of the U-Wave mobile application?

The app is available on Android and Apple app stores, and features functions like NTU campus bus timings

Q20. How informative are the current applications/NTU websites/bus stops in providing reliable bus service information?

eg. information on bus routes, services, waiting time

Q21. From Q20, scale responses of 3 and below:
What additional information to bus applications would enhance your user experience?
Please provide examples or any suggestions you may have.

Rationale
Q19 Was asked to find out if students were aware of the recently launched U-Wave mobile application, and to raise awareness of it through our survey.
Q20 Was asked to find out if current platforms have been effective in providing reliable bus information.
Q21 To ask for suggestions that students may have to improve current bus applications or information providing platforms/avenues.

Findings:
Q19.

Prior to this survey, have you heard of the U-Wave mobile application?

- Yes and I have downloaded it: 1485 (56.5%)  
- Yes: 647 (24.6%)  
- No: 495 (18.8%)

Of the 2627 students surveyed, slightly more than half (56%) claimed to have heard of, and also downloaded, the U-Wave application. 24% of students have only heard of the application. Only a minority (18%) claimed to not have heard of the U-Wave application at all.
2627 students ranked how informative the current applications and NTU website are in providing information about bus services, with “1” being not informative at all, and “5” being very informative. Nearly half (47%) of the respondents feel that current applications are very informative or quite informative. A minority of 13% feel that the applications are not very or not at all informative. About a third of the students (39%) feel that current applications are just informative.
Q21. What additional information to bus applications would enhance your user experience? Please provide examples or any suggestions you may have.

The most commonly appearing words are “accurate”, ”express”, and “timing”. These words were looked into. It was found that respondents requested for a feature which mentions which bus is an express bus and for the stops for express buses. An indicator for terminating buses was also requested.

The most requested feature by respondents was an increased accuracy of location and bus arrival timing. Other requests including bus seating capacity and crowdedness were mentioned. Selected quotes are as follows:

<table>
<thead>
<tr>
<th>Suggestions regarding bus applications</th>
<th>Quotes</th>
</tr>
</thead>
</table>
| Increased accuracy of bus locations/arrival timings | “Please improve the reliability of the bus arrival timing.”  
“I think mostly it is just the accuracy of the bus arrival timings” |
| Reflecting the type of bus service (Normal/Express)  
Bus load | “Bus loads and whether the bus is an express service, rather than just bus arrival timings” |
| Reflecting whether buses are terminating | “Capacity of the bus, whether it is Red/Blue express or normal, and if it is going to terminate soon” |
SECTION 8: OTHER SUGGESTIONS FOR IMPROVEMENT

This section is addressed by the following questions:

Q10. What safety concerns have you faced regarding any campus buses, if any?

Q22. Please let us know any other feedback regarding NTU campus bus services or transportation, if any.

For exchange students only:
Q24. From your experience in your home country, do you have any suggestion(s) to further improve NTU’s services in general?

Rationale
Q10 To ask for feedback on safety regarding campus bus services.
Q22 Was asked to gather students’ overall feedback on bus services in NTU.

Findings:
Q10. What safety concerns have you faced regarding any campus buses, if any?

Respondents are mostly concerned about how campus buses are overcrowded, especially during peak hours. Some respondents also mentioned issues with the bus door suddenly closing when people are still boarding the bus. Other concerns which are often mentioned include reckless driving (speeding, sudden braking) and people standing on the steps.

Selected quotes are as follows:

<table>
<thead>
<tr>
<th>Safety concerns regarding campus buses</th>
<th>Quotes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overcrowding and consequent issues</td>
<td>&quot;Bus overcrowding, squeezing till the door. There was an instance I witnessed someone's leg got stuck when the doors open because...&quot;</td>
</tr>
</tbody>
</table>
he stood on the door steps. He was unable to give way to people alighting; his leg was only freed after the doors closed."

“Standing on stairs and pushing of passengers during overcrowding”

“The overcrowding on the bus is dangerous, especially since some of the drivers don't drive slowly”

| Bus drivers unaware of situation at doors | “Door closes before people can properly alight” |

Q22. Please let us know any other feedback regarding NTU campus bus services or transportation, if any.

The most frequently occurring words were ‘service’, ‘time’, and ‘app’. On searching for suggestions containing such words it was found that there were several suggestions regarding bus waiting time. A problem highlighted was the bunching of buses. Two buses often came one after another and left an irregular waiting time for the next bus.

Respondents requested for higher frequency of buses during peak hours. Suggestion for the app were the same as those for Q21.
Selected quotes are as follows:

<table>
<thead>
<tr>
<th>Other feedback regarding campus bus services</th>
<th>Quotes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bunching of buses</td>
<td>“Buses frequently clump at one part of the route and run as a bunch, especially CL-R, CL-B and CR, leading to irregular waiting times at other sections of the route.”</td>
</tr>
<tr>
<td></td>
<td>“Should reduce waiting time, increase frequency of busses. Maybe try to spread them out more regularly also. Sometime 2 bus very close to each other then after that once miss those 2 buses have to wait very long.”</td>
</tr>
<tr>
<td>Uneven waiting times and bus frequency</td>
<td>“Bus ard 10 to 11am, the waiting time is approx 30min for 1 bus for both red and blue bus. I think they are all changing shift.”</td>
</tr>
</tbody>
</table>
Appendix: Sample of Survey Questions
(*Question numbering differs from main report due to logic jumps)

“Important to note:
The main scope of this survey covers the following services on weekdays:
- Campus Loop Red and Blue buses,
- Campus Rider and
- Express Shuttle bus services.

Continue

Rate your overall satisfaction toward the following aspects of campus bus services.

Continue

a. Safety *

1 2 3 4 5
Very Dissatisfied Very Satisfied

b. Accessibility *

ie. To what extent do the current bus routes cater to your destination?

1 2 3 4 5
Very Dissatisfied Very Satisfied

Voice | Service | Vibrancy
29th Nanyang Technological University Students’ Union Executive Committee
C/O One Stop @ SAC, 50 Nanyang Avenue, NS3-01-03, Academic Complex North, Singapore 639798www.ntusu.org
c. Frequency/Waiting Time *

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Dissatisfied</td>
<td></td>
<td></td>
<td></td>
<td>Very Satisfied</td>
</tr>
</tbody>
</table>

d. Accuracy of campus bus locations on bus applications *
e.g. U-Wave app

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Dissatisfied</td>
<td></td>
<td></td>
<td></td>
<td>Very Satisfied</td>
</tr>
</tbody>
</table>

2️⃣ Which timing(s) do you usually take the campus bus? *

Select all options that apply

- **A** 0800-1000
- **B** 1000-1200
- **C** 1200-1400
- **D** 1400-1600
- **E** 1600-1800
- **F** 1800-2100
- **G** 2100-2300
- **H** None of the above
Which stops do you usually board and alight the campus bus most frequently?

- Campus Loop Red

Select all options that apply:

- A R1: Hall 11
- B R2: Grad Hall 1&2
- C R3: Nanyang Crescent Hall
- D R4: Hall 12&13
- E R5: LWN Library, Opp NIE
- F R6: SBS
- G R7: WKWSCI
- H R8: Hall 7
- I R9: Yunnan Park
- J R10: Hall 4
- K R11: Hall 1 (Bik 18)
- L R12: Food Court 2
- M R13: Hall 8&9
- N None of the above
Select all options that apply

A. CR1: TCT LT, Opp. Admin Bldg
B. CR2: Student Services Centre
C. CR3: Food Court 2
D. CR4: Opp. Food Court 2
E. CR5: Hall 1 (Blk 18)
F. CR6: Pioneer MRT Station at Blk 649A
G. None of the above
4. On average, how often do you miss the bus due to overcrowding? *

A. More than once a day
B. Once a day
C. More than once a week
D. Once a week
E. Rarely
F. Never

5. At which timing(s) have you experienced overcrowding? *

Select all options that apply

A. 0800-1000
B. 1000-1200
C. 1200-1400
D. 1400-1600
E. 1600-1800
F. 1800-2100
G. 2100-2300
H. None of the above
6 → Do you use the Express Shuttle Bus services? *

Includes Red/Blue Loop Express, Lunch Express and Campus Rider Express buses

A  Yes
B  No

From Q6, if answered “yes”:

7 → On average, how frequently do you use the campus express shuttle bus service? *

A  More than once a week
B  Once a week
C  Once a month
D  Never

From Q6, if answered “no”:

7 → Why do you not use the express bus services? *

A  It does not cater to my destination
B  I prefer alternative transport options
C  I am not aware of the express bus services
D  Other

8 → How frequently are bus timings longer than what you expect? *

1  2  3  4  5

Very Often  Rarely
What safety concerns have you faced regarding any campus buses, if any?

Type your answer here...

How often do you get a seat on the campus bus? *

- A Rarely
- B Sometimes
- C Most of the time

The following section will ask for your opinion on transportation modes during final exam periods.

Finals exam period is typically from:
- End April to May
- End November to December

Continue press ENTER

What is your preferred choice of transport to your exam venue during final exam periods? *

- A Campus buses
- B Public buses (179/199)
- C Private transport (Car/Cab)
- D Walking
- E Others
12. Why are campus buses **not** your preferred choice in reaching your exam venue? *

   A. Inconvenient  
   B. Buses are usually too crowded to board  
   C. Long waiting time  
   D. Bus service is unreliable  
   E. Other

13. Have you taken any campus buses during the final exam period? *

First year students please select "No"

   A. Yes  
   B. No

14. Prior to this survey, have you heard of the U-Wave mobile application? *

The app is available on Android and Apple app stores, and features functions like NTU campus bus timings

   A. Yes and I have downloaded it  
   B. Yes  
   C. No
15 → How informative are the current applications/NTU websites/bus stops in providing reliable bus service information? *

eg. information on bus routes, services, waiting time

1 2 3 4 5

Not informative at all Very informative

16 → Please let us know any other feedback regarding NTU campus bus services or transportation, if any.

Personal Information
Please enter your personal information. Ensure it is entered accurately to be considered for the Exam Welfare Pack express queue.

Continue press ENTER

17 → I am a(n)... *

A NTU Student
B Exchange Student
18. **Nationality/Permanent Residency** *

A. Singaporean  
B. Permanent Resident of Singapore  
C. International Student

19. **Matriculation Card Number** *

Please ensure this is keyed in accurately with all alphabets in capital letters (e.g. UI234567A)

Type your answer here...

20. **NTU Email Address** *

If you are shortlisted for the Express Queue, an email will be sent to this email address. It is compulsory to use your NTU email address to be considered for the Express Queue.

Type your answer here...

21. **Faculty** *

Type or select an option...
22. Study Year *
   - A. Year 1
   - B. Year 2
   - C. Year 3
   - D. Year 4
   - E. Other

23. Do you stay in hall? *
   - A. Yes
   - B. No

24. Which hall do you stay in?

Type or select an option

25. By submitting this form, you agree that NTU Students' Union may collect, use and disclose your personal data, as provided in this form, for any purposes related to the Students' Union in accordance with the Personal Data Protection Act and our data protection policy. *

   - A. I have read and agree with the above.