

ALL-DOOR BOARDING PERFORMANCE

SUMMARY

The performance of the All-door Boarding Pilot is determined by evaluating the program across a number of categories of metrics. These categories include:

- 1) Compliance with Procedures
- 2) Ridership and Revenue
- 3) Reliability and Dwell
- 4) Customer Survey Results
- 5) Operator Survey Results

The program is still in its early stages and this document represents a snapshot of how the pilot has performed between March 1 and April 27, 2021. Overall, compliance with the program's standard operating procedures was inconsistent and has made evaluating some of the other categories more challenging. However, the teams responsible for compliance have made headway since the end of this evaluation period and the team is confident the next performance report will reflect better vehicle assignment and door-opening rates.

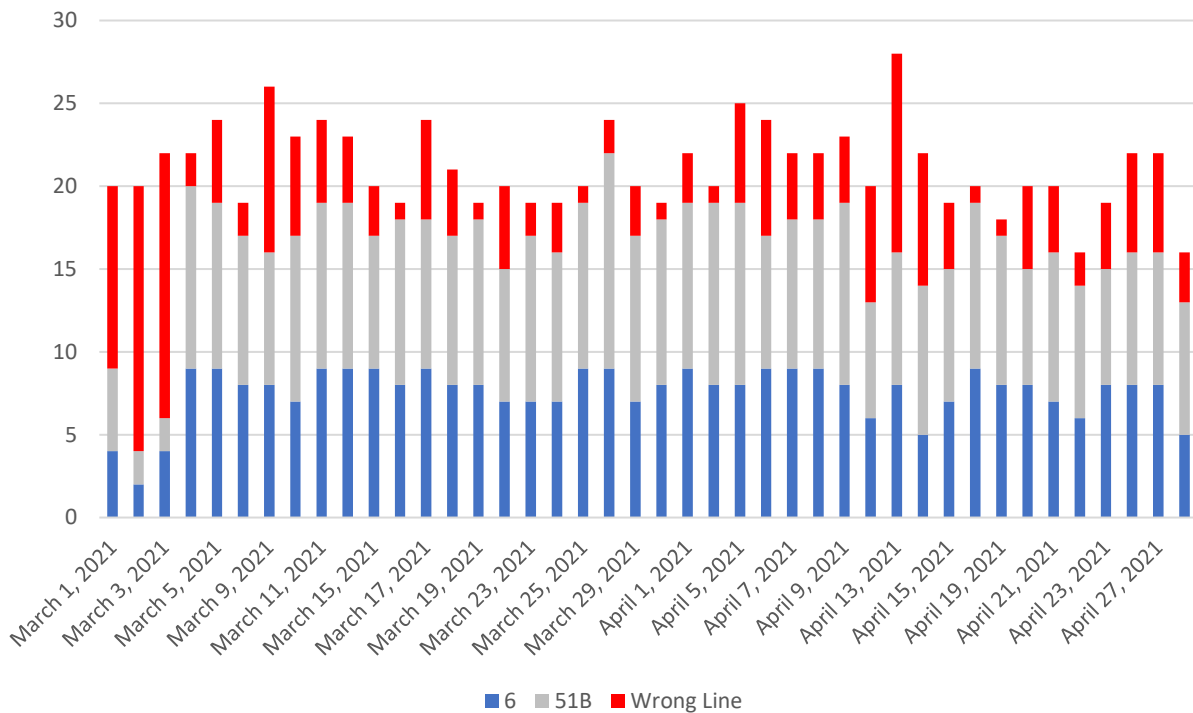
Overall, the program is having positive impacts on operations and while there are some issues identified in this report, staff is already working to address those issues.

COMPLIANCE WITH PROCEDURES

Compliance with the Standard Operating Procedures (SOP) for the All-door Boarding Pilot is crucial to the success of the program. In particular, ensuring the correct vehicles – those with rear-door Clipper readers – are assigned to lines 6 and 51B and ensuring the rear doors are actually opened so customers may board.

There are 25 vehicles at Division 2 in Emeryville that have been equipped with rear-door Clipper readers: Gillig Hybrid Buses numbered 1561 through 1580 and New Flyer Fuel Cell buses 7022 through 7026. Staff reviewed vehicle assignment data for those buses from March 1, 2021 to April 27, the latest date available at press time for this report. On weekdays, Line 6 requires nine buses and Line 51B ten, so there should be 19 buses assigned to Lines 6 and 51B each weekday. On weekends, Line 6 requires seven buses and Line 51B requires nine, so there should be 16 buses assigned each weekend day.

The pilot launched with poor adherence to the SOP. For the first three days, there were nine, four, and six buses assigned to the correct lines, respectively. Beginning Thursday, March 4, compliance improved and has remained relatively steady, with generally between 17 and 19 buses assigned to the pilot lines each weekday and 14-15 each weekend day. Looking at the chart, staff examined the number of buses assigned to the incorrect line (the red segment of the bars).

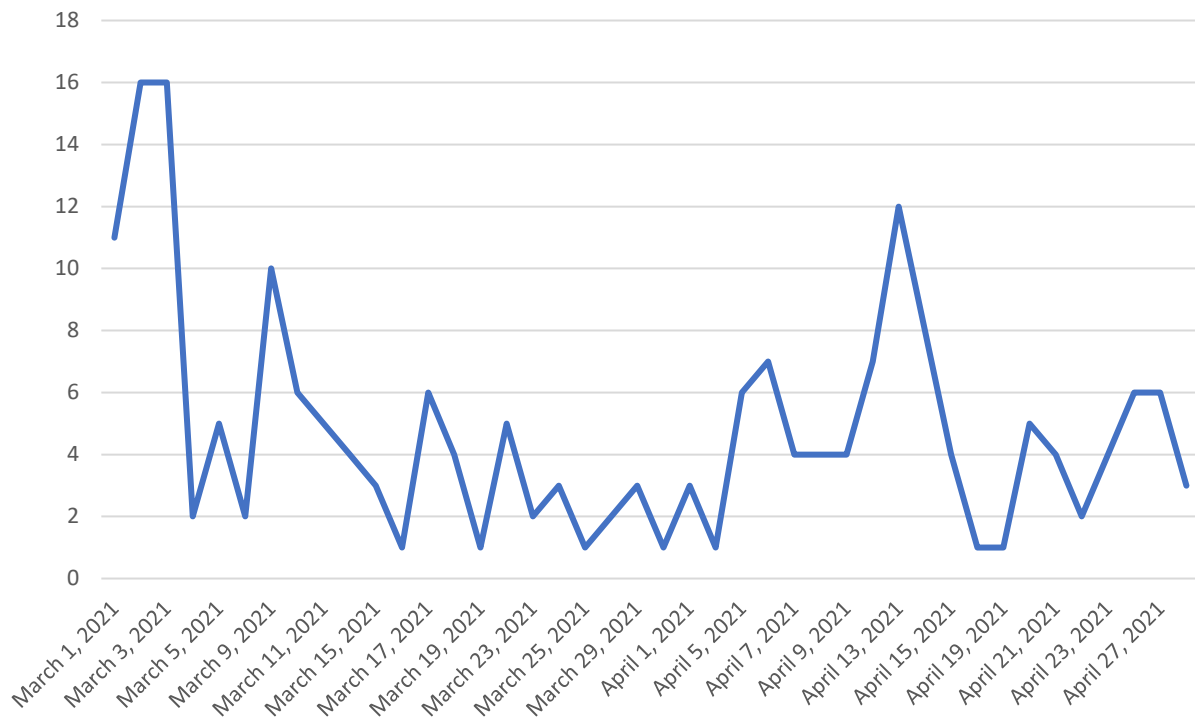
Exhibit 1 – Vehicle Assignment by Day

There is nothing to prohibit Division 2 assigning the pilot vehicles to other lines once all pilot line assignments have been filled with the correct vehicles. This means on any given weekday, there may be as many as six vehicles on weekdays or nine vehicles on weekends in the rear-door Clipper reader subfleet that can be used on non-pilot lines. However, anything more than six vehicles on weekdays or 9 vehicles on weekends means other lines are getting vehicles at the expense of the pilot lines. In addition, those 6 vehicles are intended to be spares so that there are always 19 vehicles available even when some are going through routine preventative maintenance or are otherwise unavailable.

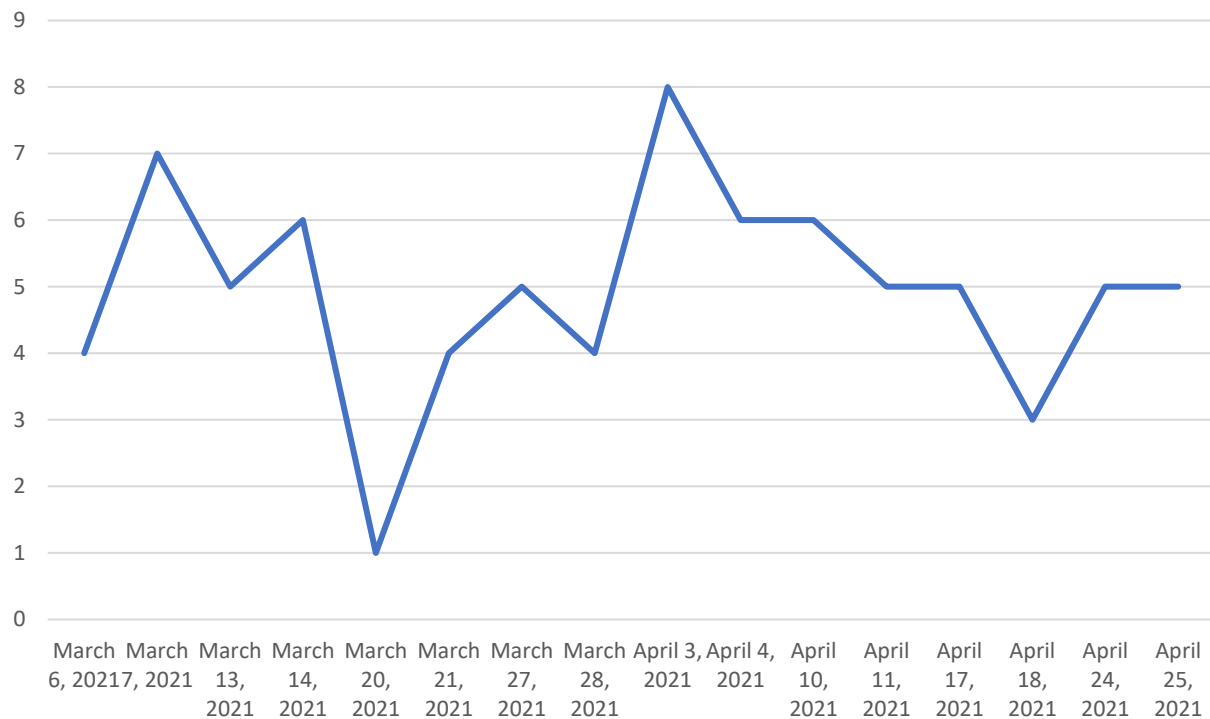
Exhibit 2 illustrates how many vehicles were assigned to non-pilot lines on weekdays. There were eight days where more than six vehicles were assigned to the non-pilot lines, thus depriving the pilot lines of sufficient vehicles with rear-door Clipper readers to effectively allow for customers to pay through the rear door. No instances have occurred on weekends where more than nine vehicles were assigned to non-pilot lines.

Besides the loss of revenue, the misassignment of vehicles also places the operators in the difficult position of allowing customers through the rear door without any means for them to pay.

Notwithstanding the complex requirements of day-to-day operations, the success of the pilot program would benefit from reserving the entire subfleet for the pilot lines alone and not using them for service on any others (except Line 851 which is interlined with Line 51B).

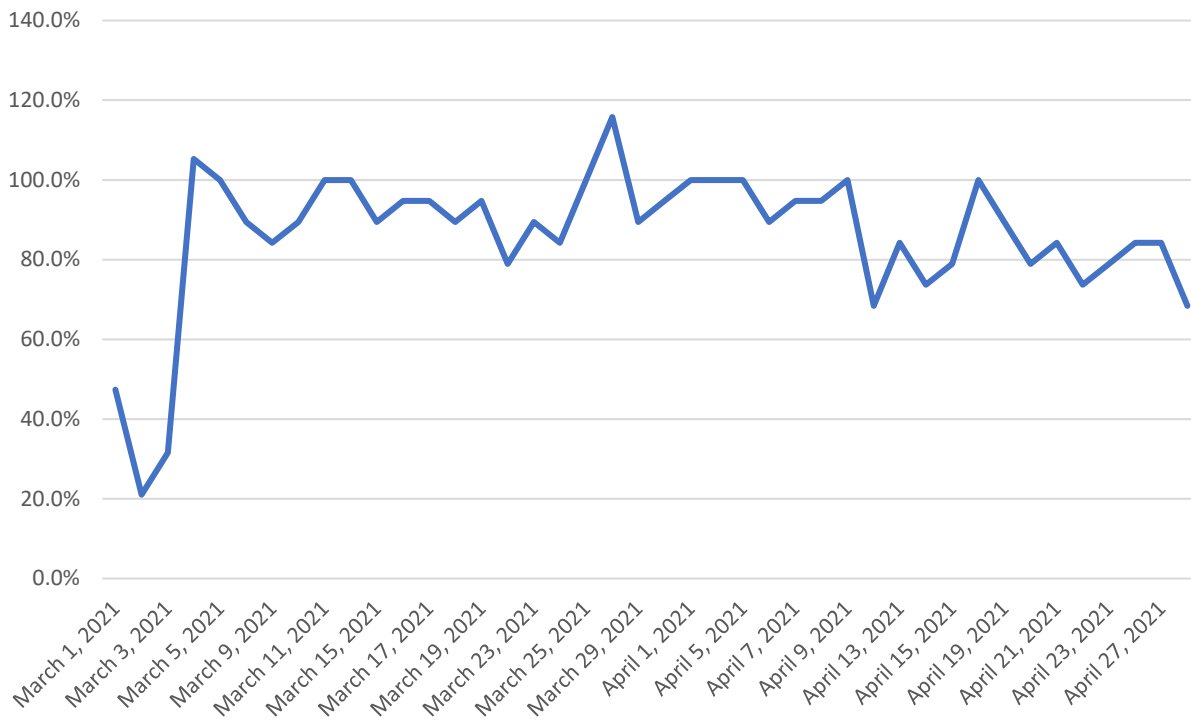
Exhibit 2 – Number of Dedicated Vehicles Assigned to Non-pilot Lines – Weekdays

Vehicle assignment was better on weekends than on weekdays, with no days exceeding the nine-vehicle limits that would prevent the correct number of vehicles assigned to pilot lines (16 per day).

Exhibit 3 – Number of Dedicated Vehicles Assigned to Non-pilot Lines – Weekends

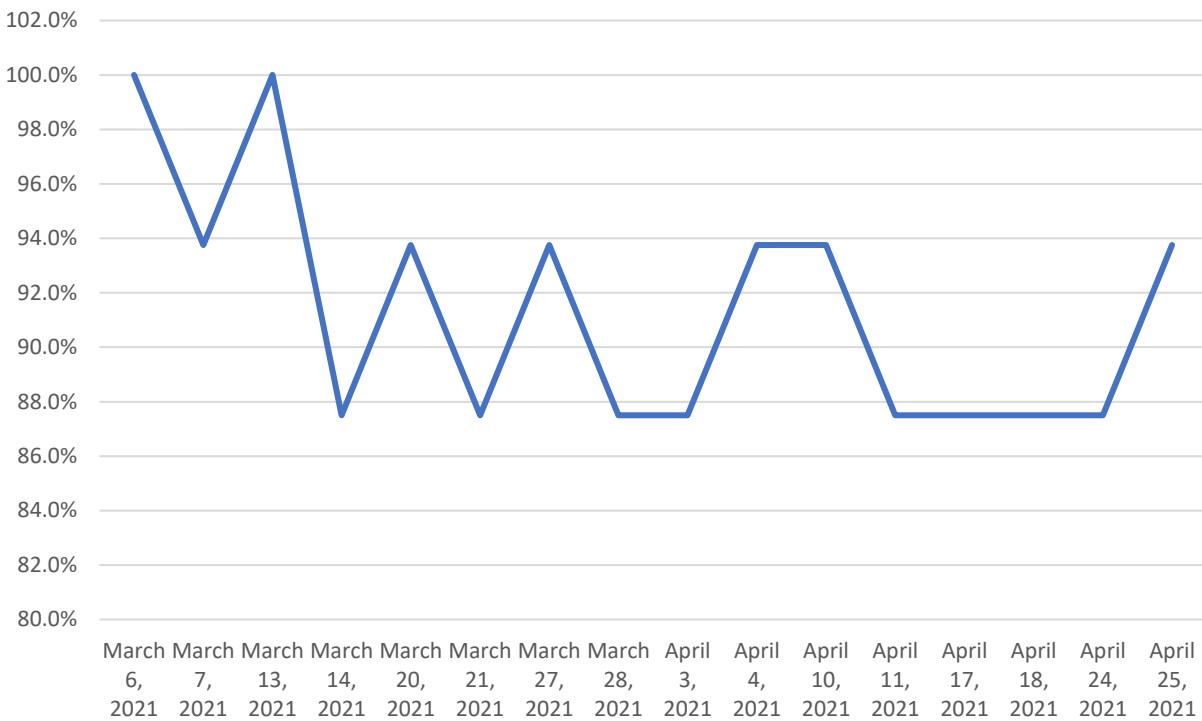
Putting it together, Exhibit 4 below illustrates the percentage of the correct number of weekday vehicles on assigned to the pilot lines. This is determined by dividing the number of vehicles assigned to lines 6, 51B, and 851 by the 19-vehicle requirement. In some cases, more than 100 percent of vehicles were assigned, likely due to road calls or other incidents when vehicles were swapped out and more than 19 vehicles from the rear-door subfleet were used for the lines.

Over the nearly two-month period for which data were available, there was 100% or better assignment of the correct vehicles 11 weekdays out of the 42 weekdays, making for a compliance rate of 26.2 percent. The majority of the days had a rate of 80 percent or better but even a single misassigned bus leads to customer and operator confusion and limits the ability of the District to evaluate the effectiveness of the program.

Exhibit4 – Percent of Dedicated Fleet Assigned to Pilot Lines – Weekdays

Compliance was generally better on weekends in that there were never fewer than 87.5 percent (14) of the rear-door buses assigned to the pilot lines. However, only two days – March 6 and March 13 – achieved the full assignment of all 16 buses on the pilot lines. This is just 12.5 percent of the 16 days included in the dataset and is below the weekday rate of 26.2 percent. This means that while on a day-to-day basis there is a higher percentage of the correct subfleet being assigned to the pilot lines, there is a lower likelihood of having completely correct assignments on the weekend versus the weekdays.

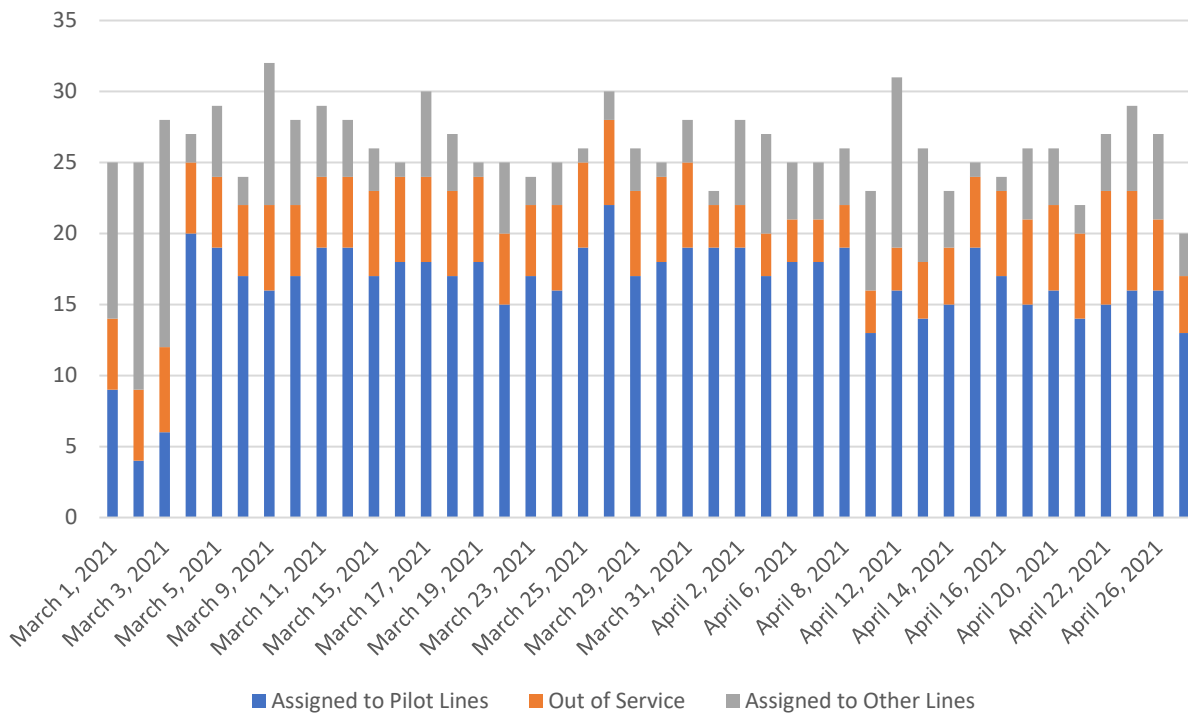
While it may be unrealistic to assign all of the correct buses to the pilot lines every day given the challenges of deploying transit service and some of the specific challenges with the newest New Flyer Fuel Cell fleet, there are six spare buses on weekdays and nine on weekends, far exceeding a typical spare ratio of 20-22 percent.

Exhibit 5 – Percent of Dedicated Fleet Assigned to Correct Line – Weekends

Looking into the cause of the problem, a key contributor is vehicle availability. Between March 1 and April 27, an average of five of the vehicles in the rear-door Clipper subfleet were out of service for one or more maintenance issues on each weekday.

Exhibit 6 below illustrates the breakdown of vehicles assigned to the pilot lines versus those assigned to non-pilot lines and those unavailable due to maintenance work. With 19 buses required for service and five buses down for warranty work, there is only one remaining spare vehicle on any given day. Given there is an average of 4.8 vehicles assigned to non-pilot lines every day, it follows that there will be only about 15-16 vehicles assigned to actual pilot lines on any given weekday.

Staff is looking at solutions, but it may be necessary to prohibit allowing these buses to operate on other lines given how many buses are potentially down for maintenance on any given day. This problem is unique to the limited scope of the pilot and would not be an issue if the District decides to implement all-door boarding systemwide.

Exhibit 6 – Vehicle Availability versus Assignments

The next critical SOP compliance measure is how often the rear doors of the buses are opened. The SOP says the following in section I.A.:

Open all doors on the bus at each stop where passengers are present and waiting for the bus.

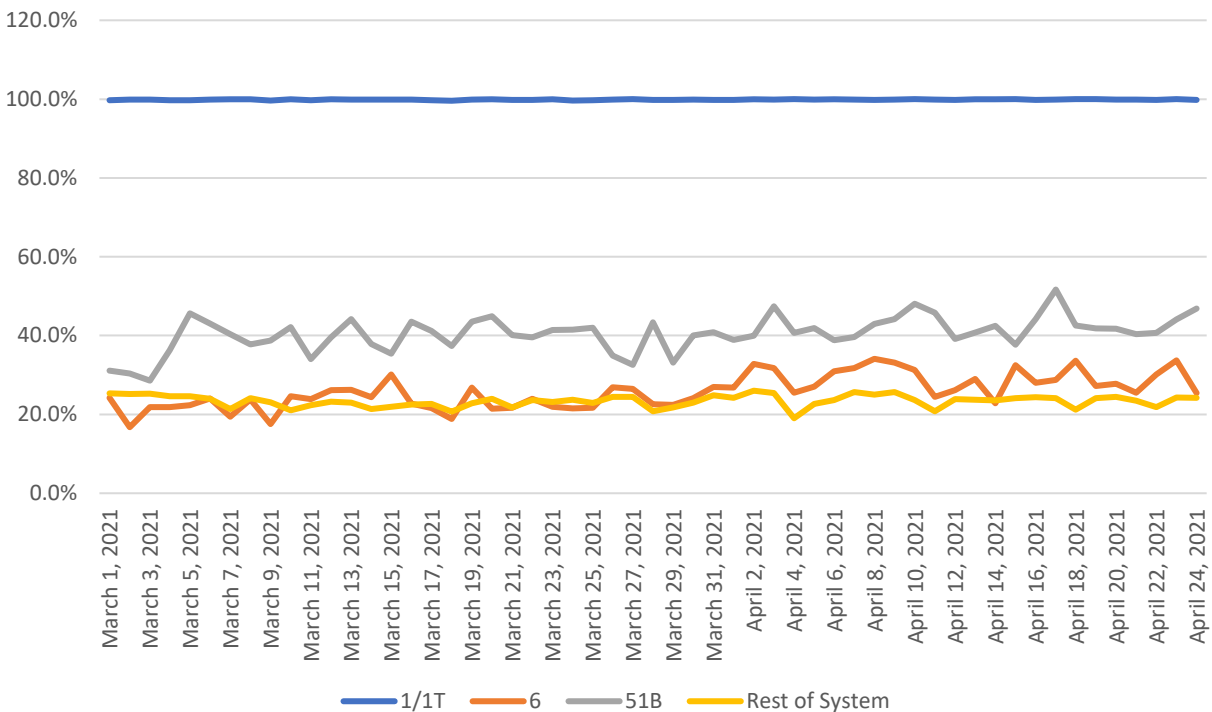
To evaluate compliance with this section, staff reviewed data from the Automatic Passenger Counter (APC) system about whether the rear doors were opened whenever the front doors were opened. The SOP doesn't leave room for operators to make a decision about whether to just open the front doors if there is only a single customer standing near the front door of the bus, for example. Rather, the procedure is more similar to that of the TEMPO BRT system where operators are required to open all doors of the bus at every station. The key difference is the all-door boarding pilot doesn't require the buses to stop at every stop even if no passengers are waiting.

Staff first broke down the percentage of time when the rear doors were opened in conjunction with the front doors opening. Staff compared lines 6 and 51B to the system as a whole and broke out TEMPO Line 1T separately to see what full compliance looks like and to ensure the data source was an accurate means of evaluating this compliance measure.

Exhibit 7 shows the two pilot lines and how they compare with 1T and the system as a whole. Line 1T had nearly 100 percent compliance across the period covered by the dataset, with only a few instances when it fell slightly below 100 percent.

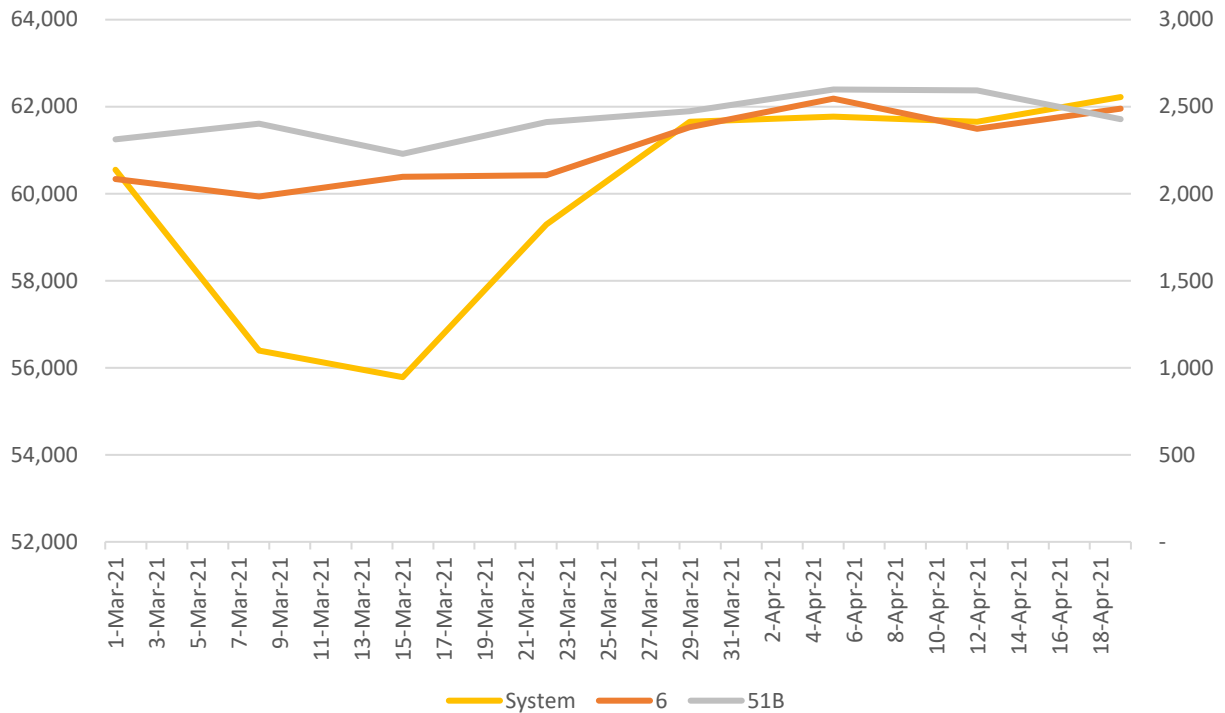
Line 51B generally had the rear-door opened at stops more than 40 percent of time, which is above the system as a whole but well below the 90-100 percent level that should be expected given the language in the SOP. Compliance was even lower on Line 6, with it lagging the system as a whole in some cases. This means operators on Line 6 are not opening the rear-door any more often than operators on any other line in the system. The “Rest of System” line excludes lines 6, 51B and 1T.

Exhibit 7 – Rear-Door Openings by Line



RIDERSHIP AND REVENUE

Impacts on ridership – positive or negative – can be challenging to parse in a short period of time and in the middle of a pandemic. Staff evaluated ridership on lines 6 and 51B and both went up as seen in Exhibit 8 below and tracked on the right-side Y axis. Average weekday ridership increased from just over 2,000 riders on each line in early March to about 2,500 weekday riders by the week of April 18. Meanwhile, system-wide ridership (seen in Exhibit 8 below and tracked on the left-side Y axis) dipped across the middle of March before re-bounding. This is likely because the two pilot lines are trunks and are much less volatile than other lines.

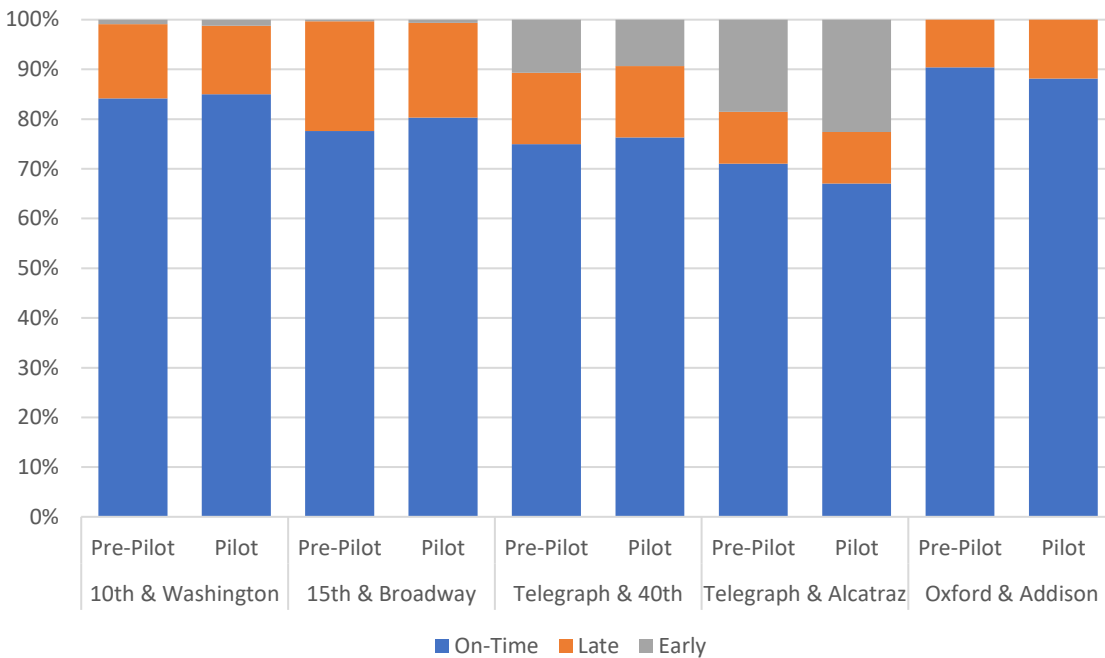
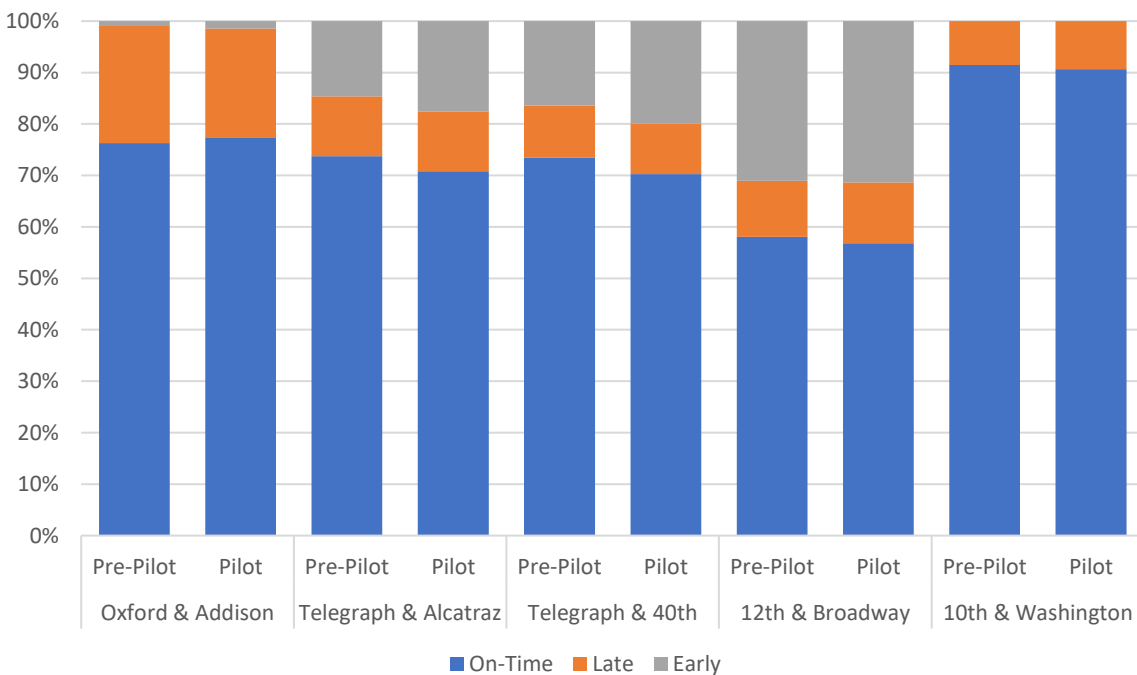
Exhibit 8 – Ridership by Line

No revenue data were available at the time this report was developed as they rely on data from CUBIC regarding rear-door Clipper tags. Staff is actively working to get high-quality data from CUBIC about how many tags on each door happened during the pilot program to compare that to tags at the front door pre-pilot to understand revenue impacts, if any.

RELIABILITY AND DWELL

Reliability is a core goal of the program because allowing multiple avenues for riders to board can speed the boarding process and allow the bus to spend more time moving and less time stopped. The primary means of determining reliability is on-time performance. Exhibits 9 and 10 illustrate Line 6 on-time performance by timepoint and direction. Overall, the new policies didn't have a substantial impact on on-time performance – positive or negative. This can be attributed to three things:

- Ridership is much lower than pre-pandemic and UC Berkeley is not in session. This means much smaller crowds boarding and alighting buses and thus fewer opportunities to shift boarding to the rear to save time.
- No schedules have been adjusted to account for faster runtimes, so buses cannot convert dwell-time savings into runtime savings.
- Compliance during the two-months, with very few days with an average of just over 16 correct buses assigned to the pilot lines out of the 19 needed for daily service. Operators on the lines are also opening the rear doors less than 40 percent of the time.

Exhibit 9 – Line 6 Northbound On-time Performance by Timepoint**Exhibit 10 – Line 6 Southbound On-time Performance by Timepoint**

The same conclusions can be drawn for Line 51B in Exhibits 11 and 12. It is key to note that early departures did increase slightly, likely due to reduced dwell per passenger.

Exhibit 11 – Line 51B Northbound On-time Performance by Timepoint

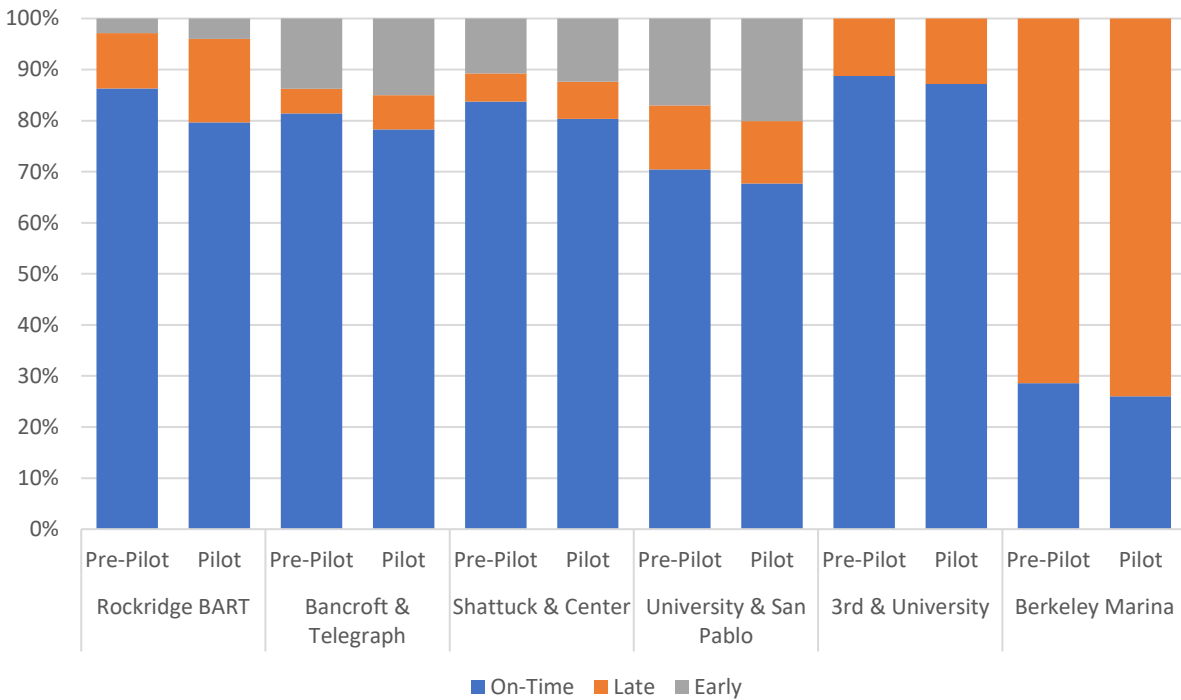
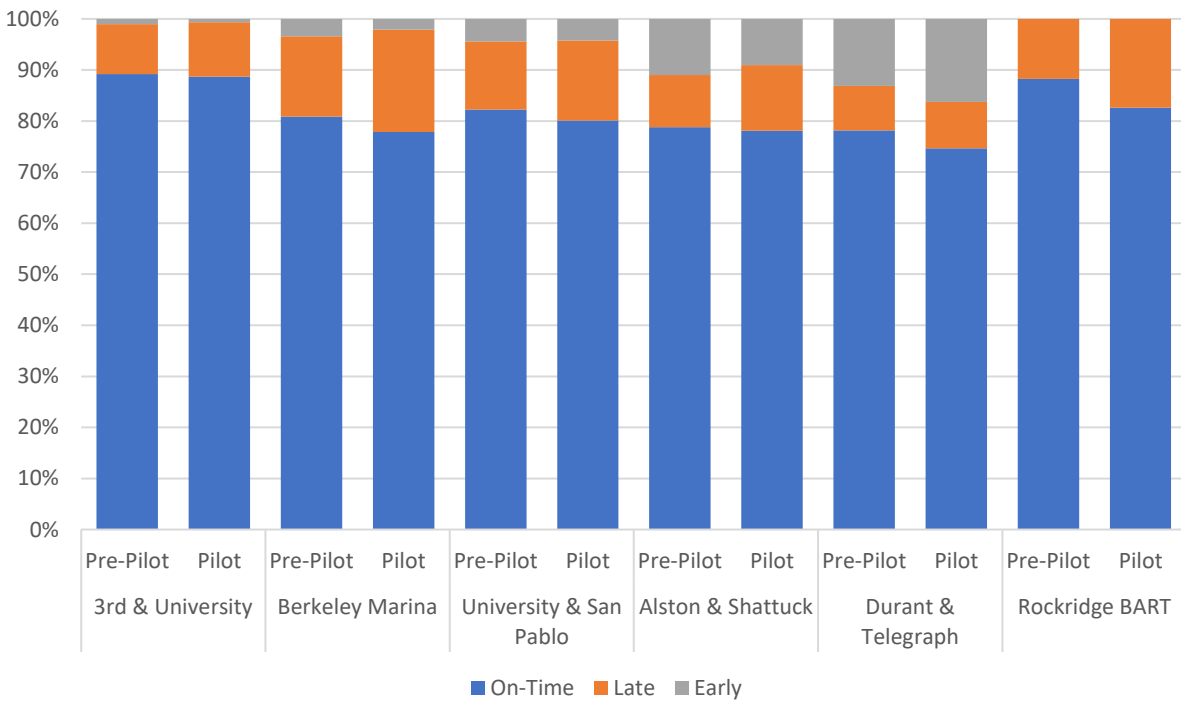


Exhibit 12 – Line 51B Southbound On-time Performance by Timepoint



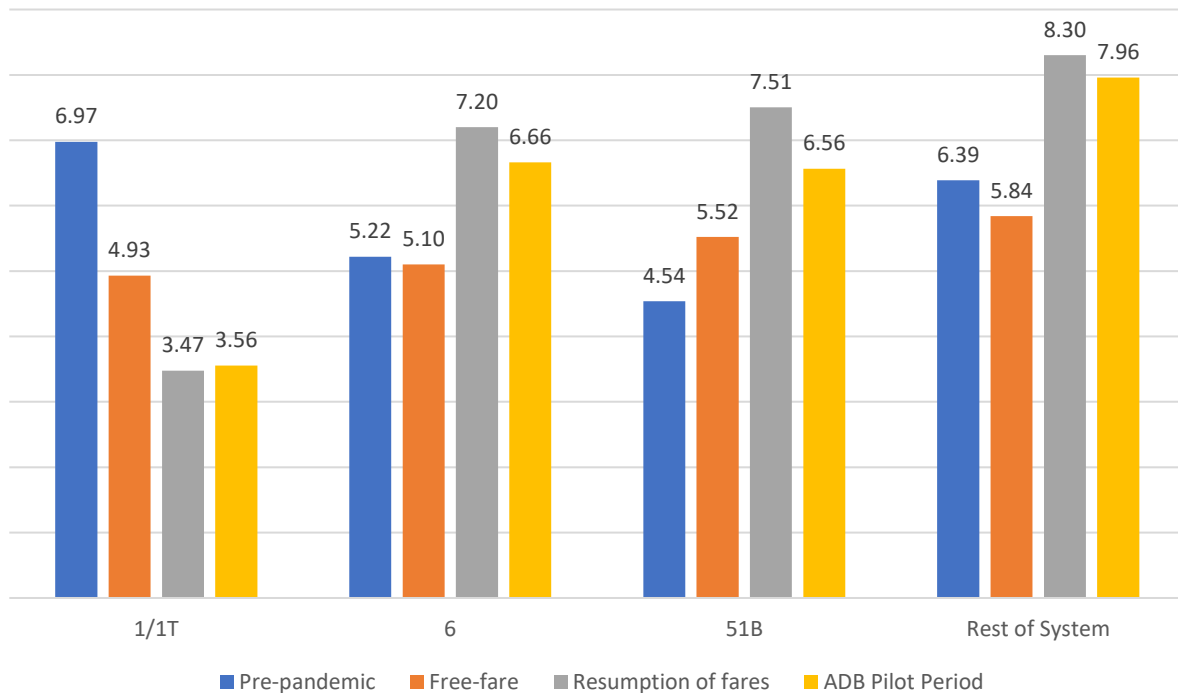
One of the clearest positive signs of success for the program is the amount of time the bus spends dwelling at the bus stop for every passenger that boards the bus – dwell per passenger. This metric is measured in seconds and staff looked at lines 1/1T, 6, 51B, and the rest of the system across four key time periods:

- 1) The period in the months leading up to the pandemic.
- 2) The no-fare rear-door-only boarding period from March to October 2020 (or November for the 1/1T),
- 3) The period between October 2020 and March 2021 when fares were back in effect, and
- 4) The period from March 1 to April 27 covered by this report when the all-door boarding pilot was in effect on lines 6 and 51B.

Dwell per passenger experienced wildly different changes per line with the pandemic. For Line 1 – which had a significant share of essential workers and converted to 1T BRT with all-door boarding in August 2020 – boarding times diminished significantly and even continued to drop once fare collection resumed.

All other lines saw dwell per passenger increase substantially once fare collection resumed. It has since dropped 0.34 seconds per passenger for the rest of the system. The key question this pilot seeks to answer is whether the pilot had a more significant effect than occurred naturally on the rest of the system. In this case Line 6 saw a decrease of 0.54 seconds per passenger and Line 51B had riders board 0.95 seconds faster than before the pilot was initiated.

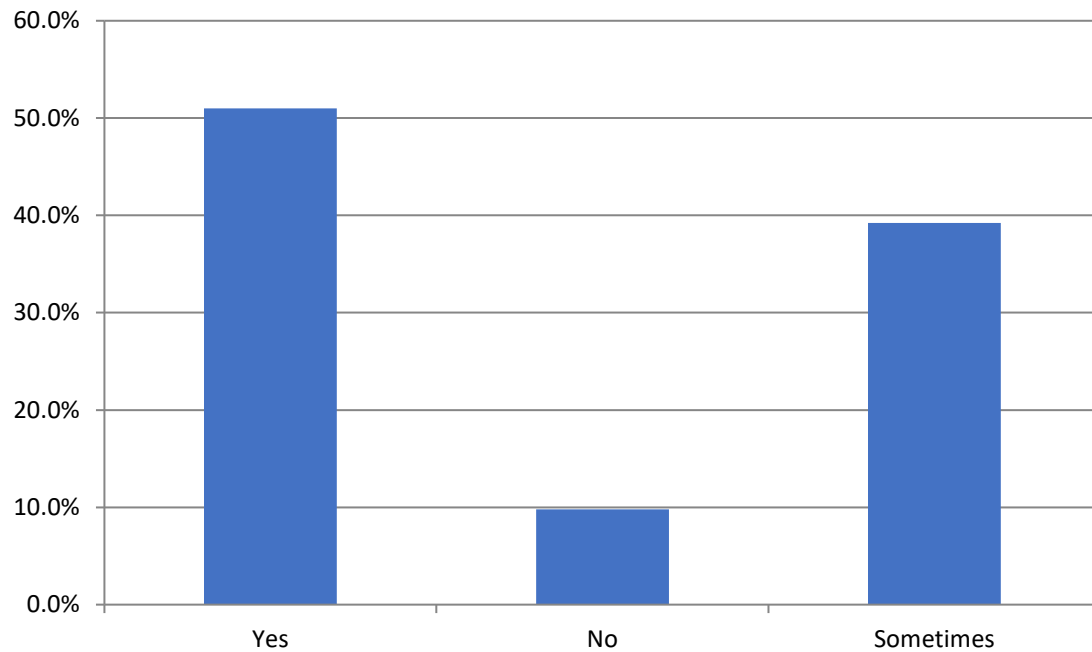
Staff believe these results are a positive sign and will improve with greater SOP compliance and higher ridership which will allow for more riders to board through both doors.

Exhibit 13 – Dwell per Boarding by Line by Timepoint

CUSTOMER SURVEY RESULTS

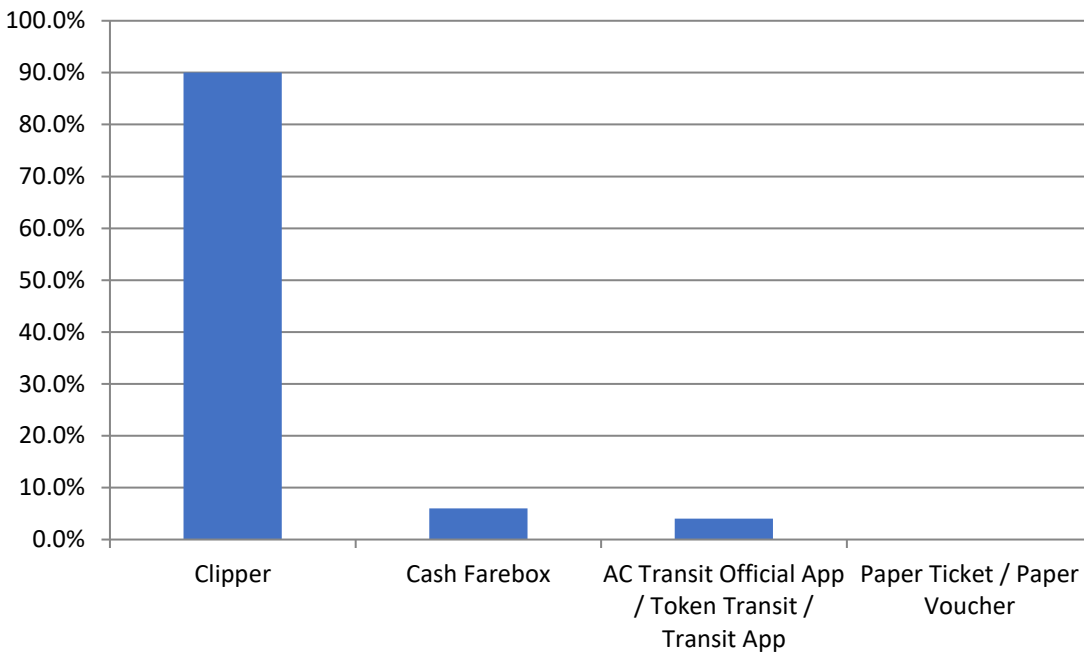
AC Transit released an online-only all-door boarding rider survey on April 7, 2021 and there have been 67 responses as of April 30. Of those responses, 14 indicated they didn't know which line they took or hadn't used either line. Among the remaining 43 responses, 43 percent indicated they rode Line 6 and 57 percent rode Line 51B.

When asked whether the operators automatically opened the rear doors at every stop, respondents indicated the operator did so about 50 percent of the time, failed to consistently do so about 10 percent of the time, and did it sometimes about 40 percent of the time. This is a higher rate than shown in data from the actual bus but is a much smaller sample size.

Exhibit 14 – Did Operator Open Rear Door at Stops

When asked how the respondents paid for their trip, nearly 90 percent indicated they used Clipper, six percent indicated they paid via cash at the farebox, and four percent paid using a mobile application. Clipper penetration on these lines was among the highest in the system pre-COVID at about 76 percent for Line 6 and 80 percent for Line 51B.

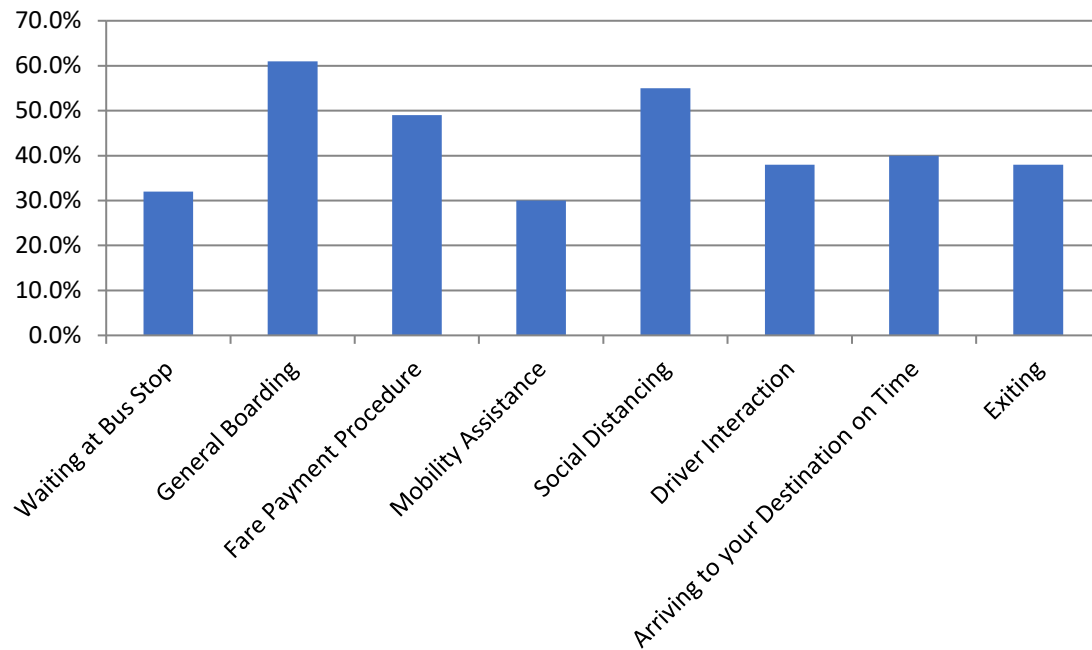
When asked whether the customers boarded through the front or rear doors, 55 percent indicated the front and 45 percent indicated using the rear door. This is promising as it points towards a more even split between the doors, allowing customers to choose either depending on perceived crowding and wait times at the front door.

Exhibit 15 – Payment Method

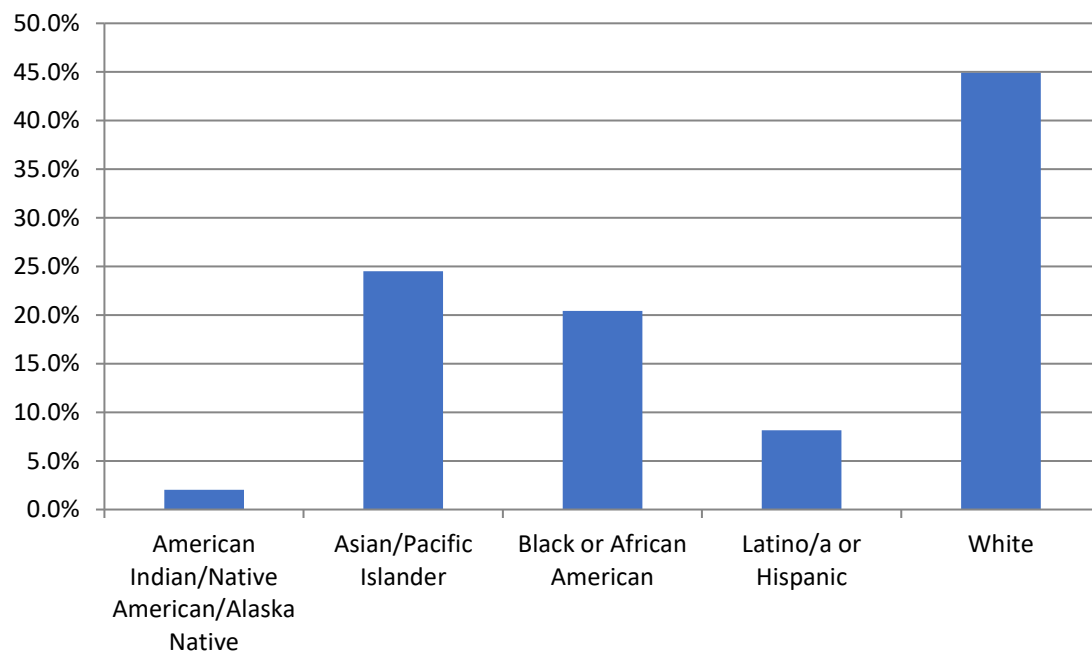
Respondents were also asked to rate whether the all-door boarding program had made improvements to their riding experience across the categories in Exhibit 16 below. Each column illustrates the number of respondents who indicated the pilot has improved that particular aspect. The pilot so far has had the greatest positive impact on three key categories: general boarding (61 percent positive), Social Distancing (55 percent), and Fare Payment Procedure (49 percent).

The pilot has had the least positive impacts for customers when waiting for the bus stop (32 percent positive) and Mobility Assistance (30 percent positive).

Customers were also able to write in comments about their impression of the pilot and how it's working. Most were positive and requested the pilot be rolled out to other high-ridership lines. Several said the pilot couldn't work as planned until capacity restrictions were lifted and more riders were allowed on-board; others didn't like the pilot because it made fare evasion easier and had concerns about safety with easier boarding for those they perceived as "homeless." The full open-ended responses are included in Appendix A.

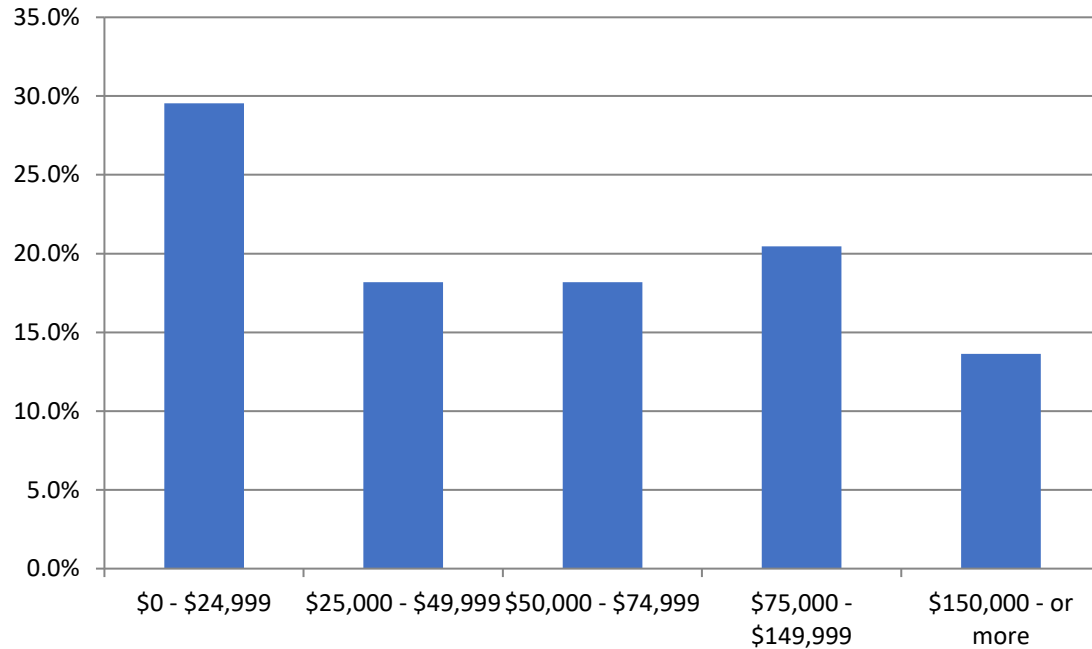
Exhibit 16 – Impact on Riding Experience

Finally, respondents were asked their race and income. Among respondents, 45 percent indicated they were white. The next largest group of respondents selected Asian/Pacific Islander followed by Black or African American and then Latino/a or Hispanic.

Exhibit 17 – Race

With respect to income, nearly 30 percent indicated they made less than \$25,000 per year and the remainder were spread almost evenly across the other categories.

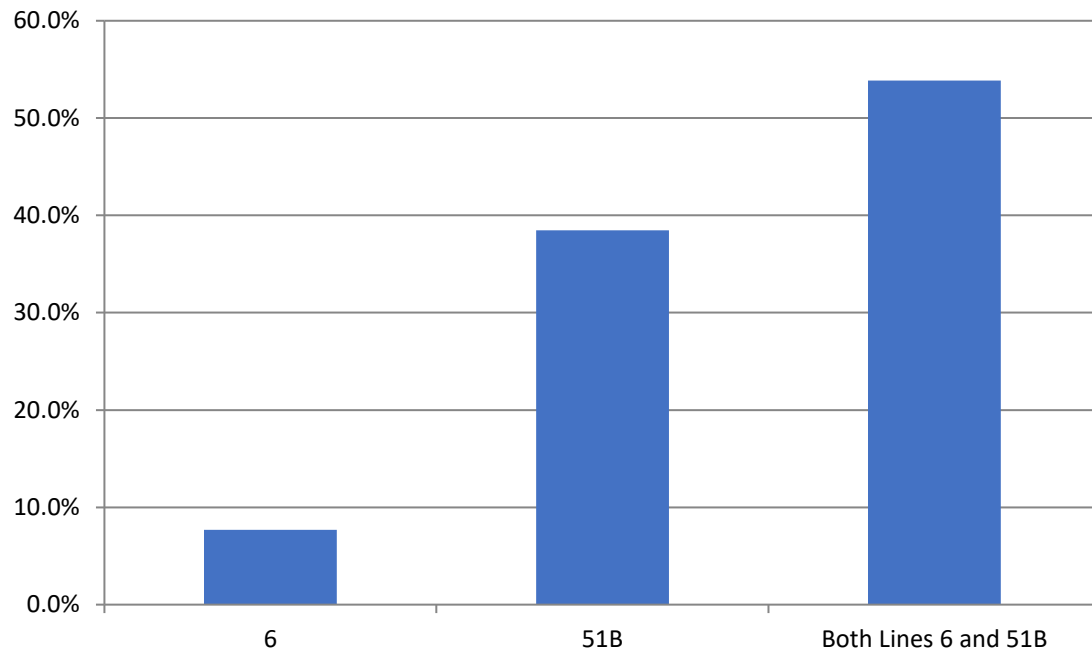
Exhibit 18 – Income



OPERATOR SURVEY RESULTS

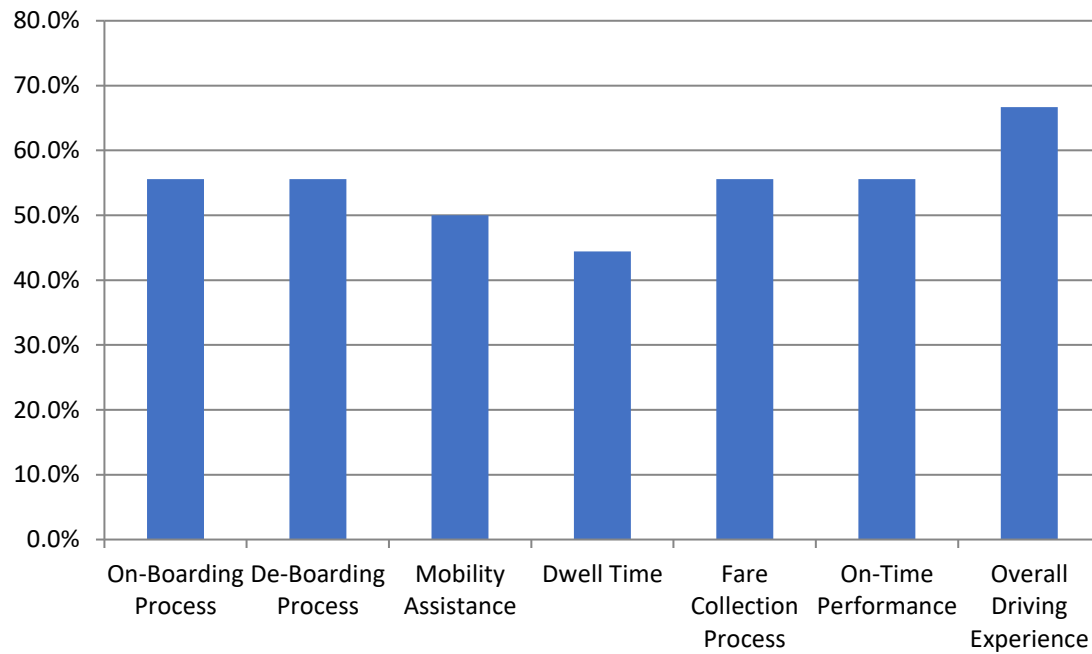
AC Transit released an online-only survey of operators at Division 2 (Emeryville) to gather their impressions of the pilot on April 15 and there had been 17 responses as of April 30. Of those responses, 7 indicated they operated either Line 6 or 51B as their regular assignment, four indicated they drive one of those lines on the extra board, five indicated N/A and one responded they drove Line 33. There may be some confusion about the question as the next question asked them to specify which line they drove and there were 13 responses, so two of the N/A responses from the first question did operate the pilot lines.

Operators were also asked whether they opened doors at every stop and 78 percent said yes, which is in stark contrast to the 35 percent figure being reported from the bus. This could be because respondents are either over-sampled from the highest-performing operators, the question is being misunderstood (i.e., respondents interpret it to mean opening the rear-door when passengers are waiting there), or they are providing an overly optimistic picture of door-opening practices.

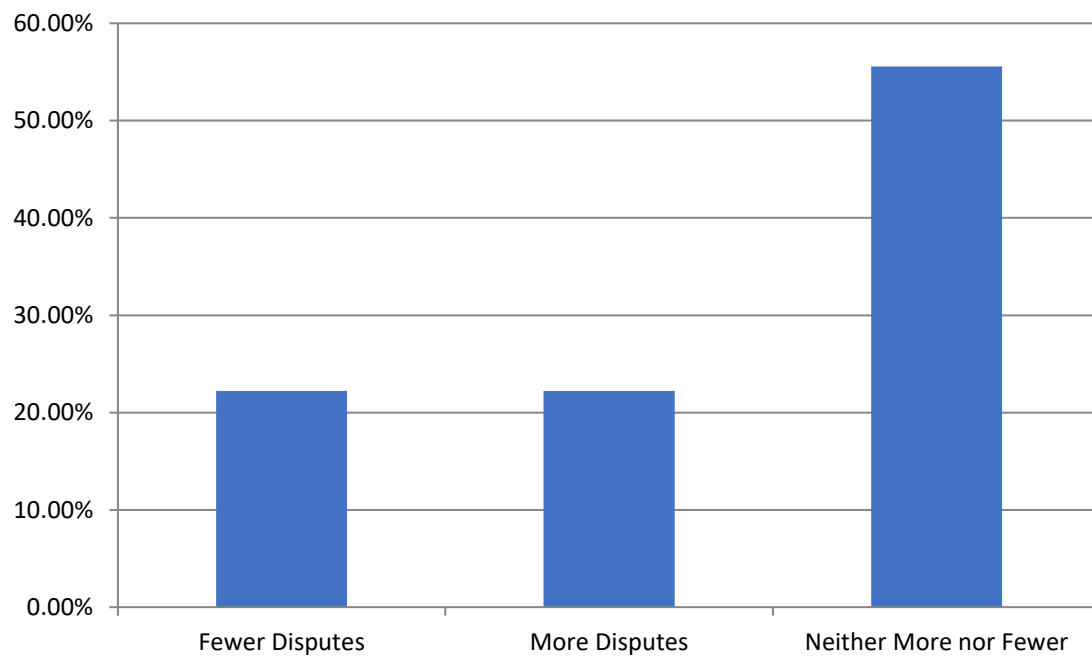
Exhibit 19 – Line Assignment

While the rider survey focused on whether the pilot had impacts on the experience of taking the bus, this survey focused on how the pilot affected the operators' experience of driving the bus, and thus their working environment. The pilot's goals for the operators are to minimize contact with customers, improve speed and reliability, and reduce conflict with customers.

The survey requested that respondents rate whether the pilot had a positive effect on the driving experience with respect to the categories in Exhibit 20 below. Fifty percent or more of respondents indicated the pilot had a positive impact on the boarding process (on and off), mobility assistance, fare collection, and on-time performance. Two-thirds said the pilot had improved the overall driving experience. It's critical to note only nine of 17 respondents answered this question.

Exhibit 20 – Impact on Driving Experience

Digging deeper on Customer conflict, respondents indicated the pilot was a mixed bag with respect to addressing customer disputes.

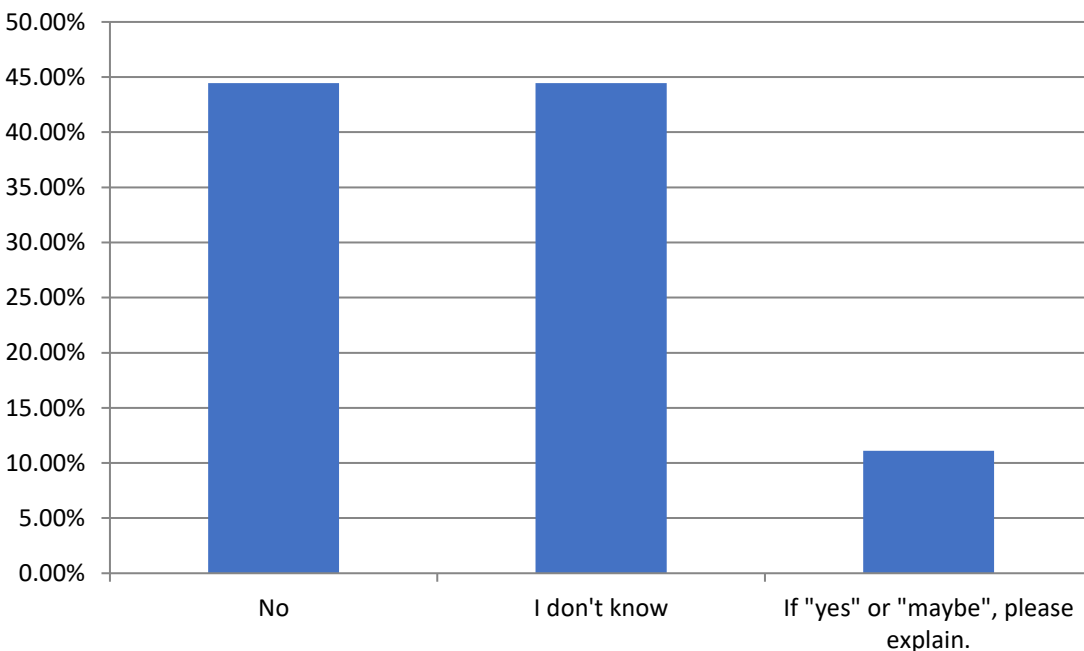
Exhibit 21 – Impact on Customer Conflict/Disputes

Respondents were also asked whether this pilot had led to a change in fare evasion onboard the bus and an equal number responded “no” and “I don’t know.” One operator responded “other”:

I don’t open the rear door because of the responsibilities I have to comply with state/federal law regarding spacing. It has caused unnecessary disputes. If this pilot was done prior it may have worked; however, we are still in a pandemic 🤖 also it makes it difficult to count opps monitor passengers putting more STRESS on the operators.

This response is consistent with some customer comments and points towards the potential for it to better succeed as the region emerges from the pandemic.

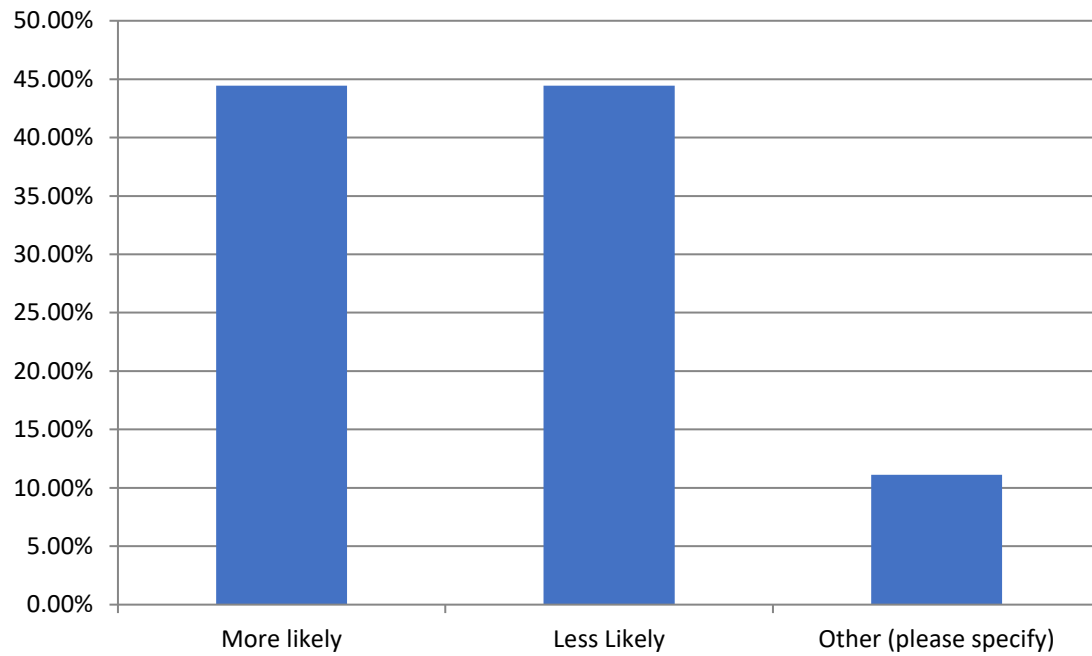
Exhibit 22 – Has Pilot Led to Change in Fare Evasion



Finally, as a key measure of whether the pilot is working for those operating it, the survey asked whether this experience so far has made operators more or less likely to bid on the 6 and 51B in future sign-ups. Respondents were evenly split, with the same number being more and less likely to bid these lines in the future as a result of the pilot. The “Other” response was as follows:

I am on the extra board, so I am glad I don’t have to operate those lines daily. Undue stress because of the Protocols in place.

This is consistent with the single comment on the previous question and reveals that operators have a significant amount to contend with as they operate in the pandemic. Easing pandemic restrictions may reduce stress on operators and allow for better evaluation of the pilot program.

Exhibit 23 – Has Pilot Made You More or Less Likely to Bid 6 and 51B Assignments

Appendix B includes full comments from operators on what common problems they witnessed and recommendations for improvements to the program.

APPENDIX A – RIDER SURVEY COMMENTS

1	There should be an option for those with the Token Transit App.
2	I like
3	I like the concept. This is a great idea when social distancing and capacity limits are no longer needed. I think this change should be made permanent after the pilot ends.
4	Missed being able to greet the driver as I walked onboard, but appreciated the efficiency and distancing. This is how Muni buses work and it's long due for AC Transit to work the same way.
5	Rear door boarding wasn't allowed when I tried so it didn't improve system because it wasn't actually happening
6	With limited capacity, the benefits of rear boarding aren't realized.
7	I believe this new system does offer raider convenience but also allows trouble makers opportunities to climb aboard as well. I was on the 51B and entered through the back scanned my clipper and noticed the man behind didn't scan his clipper. The man caused a ruckus and wouldn't put his mask own I felt unsafe. The driver had no choice but to call the sheriffs, whom took forever to come get him off the bus. This new system offers convenience to abiding riders, but also allows trouble makers opportunities as well to get a free ride.
8	Being mobility challenged, I prefer the back door.
9	no impact
10	You're opening a can of worms by doing this. Homeless ppl are going to ride for free!!!
11	work better on assure drivers start on time/no delays/no lost bus/no abandoned riders when bus on detour. who cares about boarding?
12	I loved being able to use all-door boarding - it allowed an elderly woman to debark in front while I was able to board in the back, speeding up the process for everyone.
13	I didn't have to wait behind the line of people that use cash or have questions for the operator. It helped me board quicker and social distance better since I didn't have to stand behind the people bunched up at the front waiting to get on.
14	Please do this on all high-traffic lines.
15	Please include this system wide. Used it on muni and it was very effective and sped up the loading process
16	I was very excited to hear about the all door boarding pilot. AC Transit really needs all door boarding. It works well on Muni and should be the standard throughout the Bay Area. Haven't had a chance to try it on the 6 or 51 yet, but I'm sure it will be an improvement when I start riding buses again.
17	It is SO GOOD! I've been on a bus with people with mobility issues, where they could get on at the front while others got on at the back and it's smooth and fast and it's AMAZING!
18	Should be expanded to the TEMPO, 18, 57, 51A and 72 lines.

19	Yesterday was the first day of my riding AC Transit since March 2020, so I have had no experience with AC Transit for more than one year (until yesterday, April 7, 2021).
20	Rear door boarding has made life great. The bus arrives, I jump in from the back right into my usual seat near the rear wheels, and the bus speeds off. Driver doesn't have to fiddle with the plastic guard, I don't need to walk through a bus full of passengers, and I can finally board with my Clipper like on Muni, skipping the front door. Very positive experience!
21	Time-saving in boarding & finding way to seats & helps social distancing
22	I think the All-Door pilot program is a good idea and should be instituted for all AC Transit buses.
23	It's all above.... :-)
24	Have supervisor's remind bus operators to inform riders on the 6 and 51 lines that we can pay and board at the rear doors. It is their job.
25	Good Idea - safer for the driver. But too often overcrowded - Drivers don't pay attention or just plain stupid. - Vaccinated twice but still worried
26	Haven't taken any bus since July 2020. First of all the mask mandate was hard to enforce, second I had pain in my hip which resulted in me having a total hip replacement surgery in September. I said that to say that although there were many signs talking about unseen disabilities many of the drivers still insisted on me boarding at the back of the bus which does not lower like the front of the bus. Lastly the passenger number limits made it impossible for me to count on me even riding the bus. I had to resort to taking Lyft round trip to work every day
27	while used to the process on Muni, AC drivers are less careful about pulling to the curb for the rear door. as my 76 year old knees become less limber, stepping up from or down to the pavement is less comfortable
28	I think its a good idea overall
29	AC Transit Drivers need more passenger relations service training, especially, disabled and elderly passenger relations training, and some AC Transit Drivers, need disciplinary measures to be taken by AC Transit Mgmt.
30	I worry that fare evasion will increase and cause more inappropriate behavior onboard the buses
31	I did notice it was smoother on & off boarding. Riders were getting off more from the rear door. Normally people are trying to get off in the front of bus.
32	I have not ridden on the bus since last year.
33	over all I think ac is one of the best service and i wish to thank all of the ac staff
34	Nice
35	I hope they will use this on all the buses
36	I think this is a great idea-- San Francisco already does this, and I would like this to be expanded to all buses!

APPENDIX B – OPERATOR SURVEY COMMENTS

Are there any common problems you see that need to be addressed? If so, please specify.	
1	Some bus don't have clippers scanner in rear door yet buy use to service 51B.
2	None
3	Making sure all pilot lines have clipper device on rear doors.
4	Fare evasion
5	Rear door boarding does not allow people to understand who's coming off or who's coming on. It also confuses the people in the front door to whether or not they can get on or off. Furthermore if the bus does not have the clipper card at the back door it made no sense for the person to go through the back door. I've had several cases where I've gotten a bus that does not have a clipper card at the back door. And furthermore if you were going to do this it should have been all runs cuz you totally have the public confused that they can do this on every route so now more for fair invasions are happening on other routes because other people have ridden the bus with clipper cards in the back door and they think it's on all routes.
6	N/A
7	The situation I mentioned above in this survey
8	People still don't know that they can use both doors. More PSA's are required.

Do you have recommendations on how to improve the All-Door Boarding program? Please specify.	
1	Make it so that the only passengers that can sit in the area directly behind you are the handicap, everyone else should sit beyond that point and still have a limit to how many people can get on the bus.
2	None
3	Rear door boarding results in less confrontation with passengers, allows the schedule to flow more freely as long as it's a reasonable schedule.
4	Just do rear boarding - people board and sit faster loading from the rear doors
5	We are not Muni stick to who you are AC Transit
6	Wait until we go back to FULL capacity ridership than the program may give ac transit the results it's desires.
7	More PSA