PASS-UP ANALYSIS REPORT

This report details the District's experience with pass-ups since the beginning of the COVID-19 pandemic in March 2020 as well as efforts to address those pass-ups issues. The first section of the report details the extent of the problem, the second part of the report walks through solutions put in place to date, and the final section explains key challenges to further progress.

1 – PASS-UP PROBLEM DEFINITION

Three key issues contributed to an increase in pass-ups in March 2020 as shelter-in-place orders took effect and riders needed to continue to rely on AC Transit for essential trips such as travel to and from work:

1) Six-foot distancing requirements cut on-board capacity to approximately one-quarter to one-third of pre-COVID capacity (i.e., 10 passengers on a 40-foot coach).
2) Fares were suspended to reduce contact between riders and operators but also encouraged additional ridership.
3) Reductions in available workforce due to the direct impacts of the pandemic on AC Transit required reducing service to 65% of pre-COVID levels.

This meant that while ridership dropped to 30% of pre-pandemic levels, many key lines saw capacity diminish even more. The increased demand for transit service caused by the free fare period caused ridership to climb from March to October, leading to increased crowding. In April 2020, there was an 8% likelihood that a customer waiting at a stop would see an overcrowded bus (but not necessarily be passed-up) system-wide. By September, this rate grew to above 12 percent.

These issues have been particularly acute among AC Transit's highest-patronized lines. The percentages for urban trunk lines far exceed system-wide averages. In April 2020, customers waiting at stops saw overcrowded buses approximately 13% of the time. By September, this percentage grew to 19%, or nearly 1 in 5.

Between 2:00 p.m. and 5:00 p.m., which is the period where the data show the most crowding, on a system-wide basis, customers in Fall 2020 could expect buses approaching them to be overcrowded about 15% of the time, and customers waiting for buses along trunk lines during these peak times could expect buses to be overcrowded approximately 25% of the time, or 1 in 4 trips.

The District re-instated fare collection in October 2020 with the installation of operator partitions on all buses, and at that point, both ridership and crowding declined substantially. Both have held steady with 56,000 daily riders as of the week of March 15, 2021, the second-highest figure in the Bay Area, and crowding percentages cut by approximately 40%. Ridership is expected to increase as students return to in-person learning, non-essential worksites open, and vaccination rates increase.

PASS-UP MEASUREMENT

The six-foot physical distancing requirements put in place in March 2020 limited the bus capacities significantly. **Exhibit 1** illustrates the specific changes in capacity.

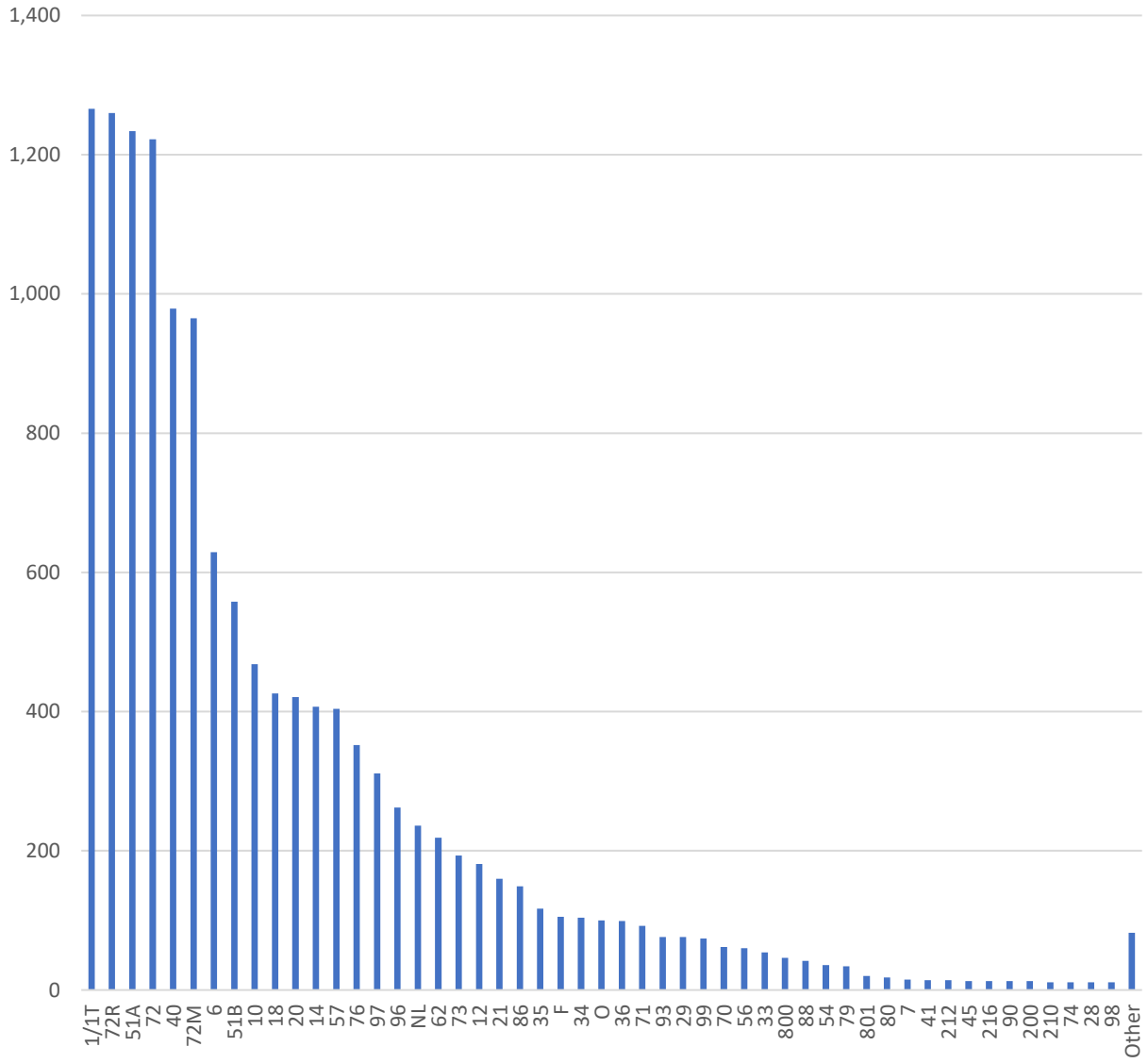
Exhibit 1 – Vehicle Capacity Constraints

Bus Type	Normal Seating	Load Limit	COVID Capacity
24 Foot	16	20	Not Used
30 Foot	25	35	6
40 Foot	36	50	10
60 Foot	54	65	16
MCI	57	57	Not Used
Double Decker	78	100	24

To ensure compliance with this mandate, the Transportation Department began instructing operators to switch their vehicle headsigns to read “drop-off only” and request permission from the Operations Control Center (OCC) to express the bus whenever capacity limits were reached. Boarding would only be allowed when the passengers already on the bus would request to get off and free up room for new passengers. The OCC began officially recording these incidents in June 2020 and there have been more than 13,000 of these drop-off-only events between then and March 2021.

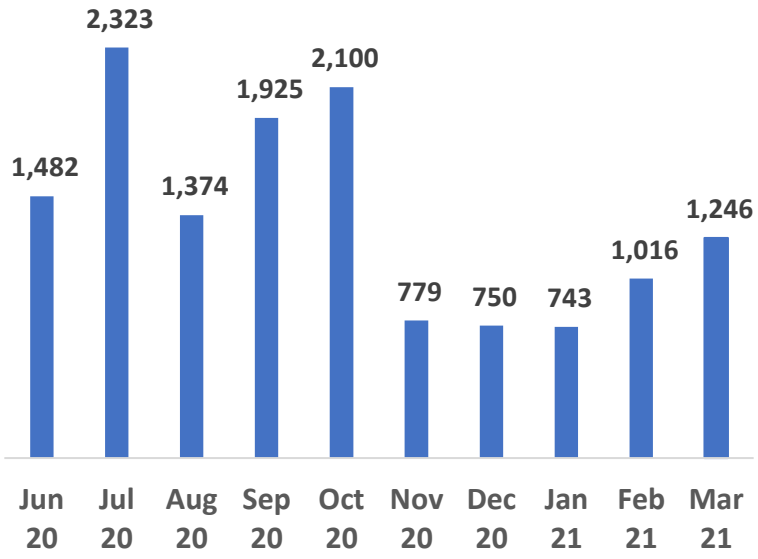
Exhibit 2 illustrates the breakdown of these drop-off only incidents – events where a bus is given permission to pass stops unless a customer wants to exist the bus – by line. It’s clear the lines where most overcrowding is occurring are trunk lines, with one corridor – San Pablo lines 72, 72M, and 72R – accounting for 25% of all incidents. Other major lines with significant overcrowding are all on trunk lines where service was increased to pre-pandemic levels in August 2020 – lines 1T, 6, 40, 51A, 51B.

Exhibit 2 – Drop-off Only Incidents by Line



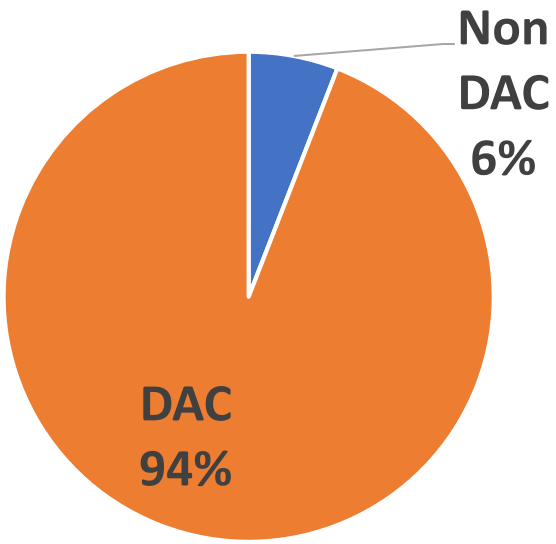
When broken down by month, the effect of fare collection is made clear in the drop between October and November 2020 seen in the chart below.

Exhibit 3 – Drop-off Only Incidents by Month



When breaking down the drop-off only data by line, staff also analyzed whether those lines service communities designated as Disadvantaged Communities (DACs) by the State of California and identified in the District's Clean Corridors program. The results are clear, 94 percent of the drop-off only incidents occurred on lines that serve DACs.

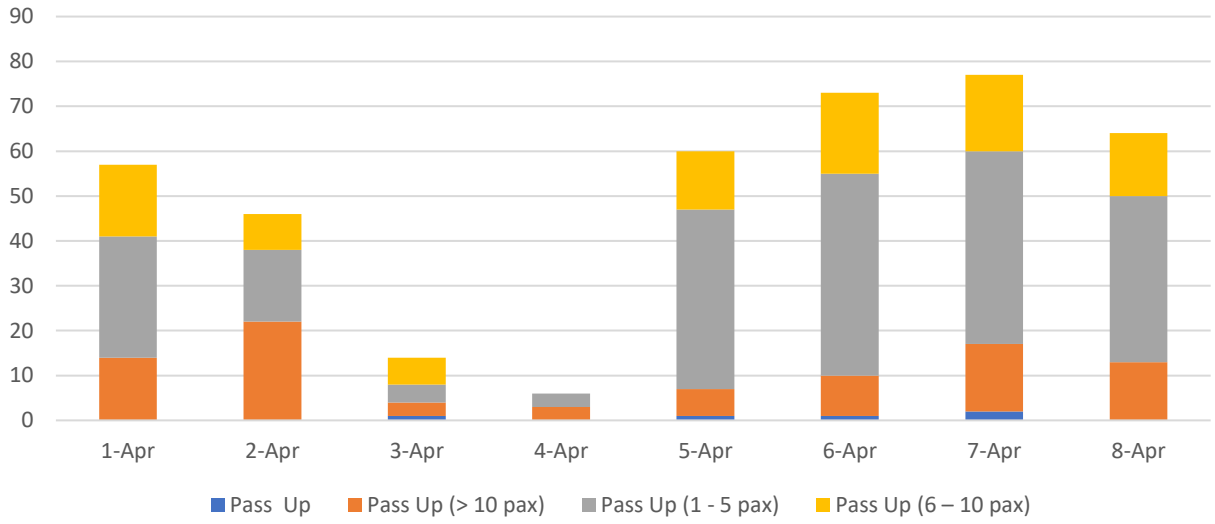
Exhibit 4 – Drop-off Only Incidents by DAC



As of in March 2021, the operators can track pass-ups on their Transit Control Head (TCH) vehicle tablet in the driver compartment area. The data revealed that between April 1 and April 8, there were 401 incidents when operators reported a pass-up on the TCH. There are three options for

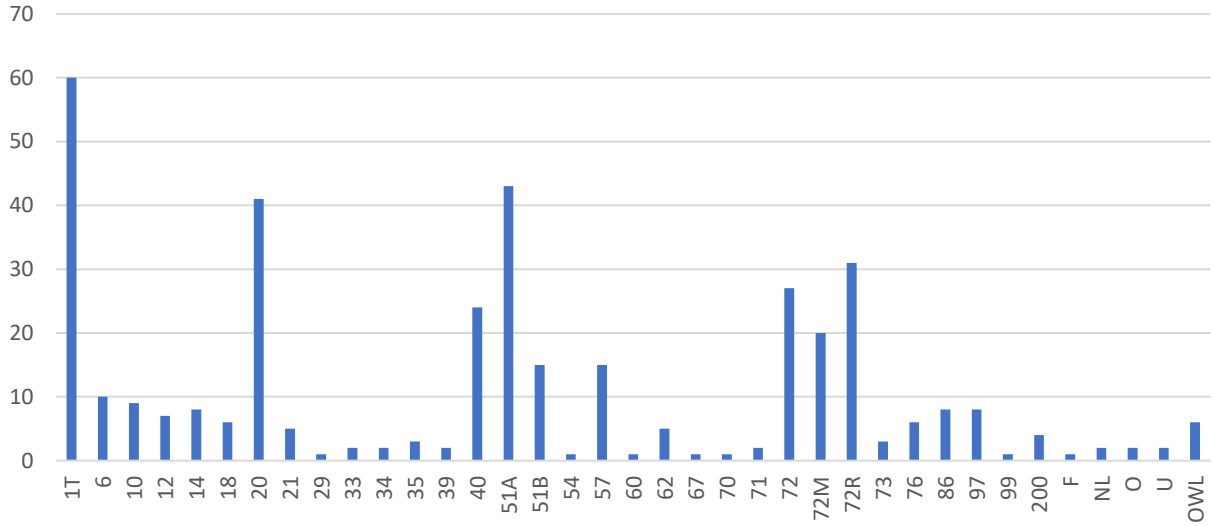
reporting the pass up 1) 1-5 passengers on the bus, 2) 6-10 passengers on the bus, and 3) more than 10 passengers on the bus.

Exhibit 5 – Operator-reported Pass-ups by Date and Type



When looking at the operator-reported pass-ups by line, the pass-ups are clustered on Lines 1T, 20, 40, 51A and B, and the San Pablo corridor (72, 72M, 72R).

Exhibit 6 – Operator-reported Pass-ups by line



2 – SOLUTIONS

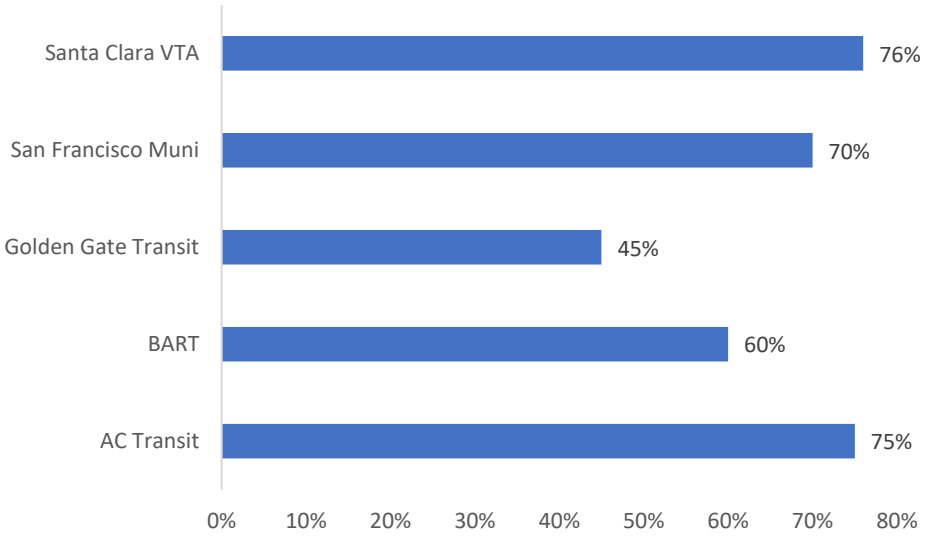
The District has implemented the following solutions to address the pass-up issues that have arisen since the start of the pandemic:

1) Added back service in August 2020,
2) Resumed Fare Collection, and
3) Implemented a Standby Bus Program.

SERVICE ADJUSTMENTS

In August 2020, AC Transit used ridership data and reports of overcrowding to identify lines that should have their service levels increased to pre-pandemic levels. Overall, the service increases brought the District up to 75% of pre-COVID levels. These service increases were focused on all trunk lines and most crosstown lines serving disadvantaged communities where essential trip ridership had remained strong. AC Transit has brought back more service than all large bus operator peers in the Bay Area except for Santa Clara Valley Transportation Authority (VTA) which is at 76% of pre-COVID levels vs AC Transit's 75%.

Exhibit 7 – Service Percentage by Agency



Source: San Francisco Chronicle as of December 23, 2020

FARE COLLECTION

The District resumed fare collection on all non-Tempo lines on October 19, 2020 and fare collection began for the first time on Tempo several weeks later on November 9. This resulted in an immediate 22,000-rider drop on the average weekday and reduced some of the overcrowding pressure on the system. However, as the region begins to reopen, staff expects ridership to begin climbing once again.

STANDBY BUS PROGRAM

The discussion of the Standby Bus Program is split into two sections – overview of the program and how it operates, and its performance.

Overview

Each month, Transportation requests a list of 40-45 priority blocks (bus assignments) (10-12 per division) that are routinely overcrowded. Transportation then assigns available operators and buses to "shadow" those blocks to pick up any riders who could not be carried due to overcrowding on the primary bus.

This process started with staff analyzing trip-level Automatic Passenger Counter (APC) data. Each month, all trips that had APC data collected were assigned into two categories: 1) trips that exceeded the physical distancing maximum load (the recommended limit for the number of passengers on board the bus) at any point during that trip and 2) trips that did not.

Since vehicle numbers are embedded in the APC data, the overcrowding assignment could be refined by vehicle type. For example, a load of 12 would exceed the physical distancing maximum load of 10 on a 40-foot bus but not the maximum load of 16 on an articulated 60-foot bus. Appendix 1 is a sample report showing the percentage of weekday trips that had physical distancing maximum loads exceeded in descending order by route for January 2021.

To assist Transportation in deploying resources to effectively address overcrowding resulting from physical distancing maximum loads, the information in Appendix *1* is refined to identify the blocks that typically saw such overcrowding. Appendix *2* is a sample report showing the blocks that had the highest percentage of weekday trips with physical distancing maximum loads exceeded in descending order by division for January 2021. With this information, the Operations Control Center (OCC) can prioritize assignment of standby bus service to the blocks identified.

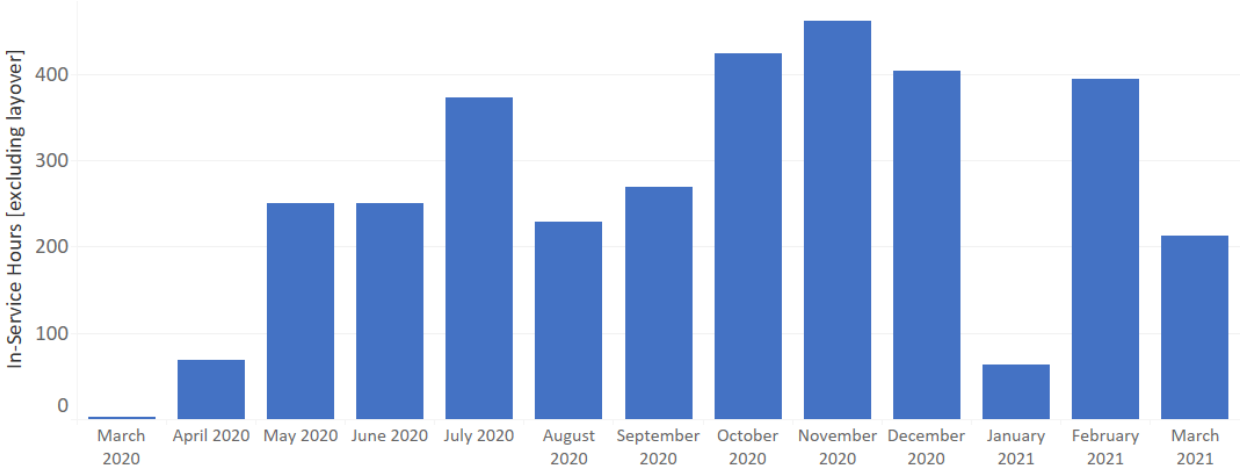
Performance

With data from the computer-aided dispatch (CAD) system provided by the OCC, staff can identify approximately where and when standby service has been deployed over the course of the pandemic, and how many riders the District has carried. Technological integration issues stemming from probable operator log-on issues and the unscheduled nature of this service have prevented full analysis by route and by trip, but even with these limitations, it is possible to establish whether the District's efforts to mitigate overcrowding issues through the standby service program have been effective.

As part of the standby bus program, the District's transportation department has deployed between 70 and 450 hours per month of extra unscheduled bus service

between April 2020 and March 2021, with the vast majority deployed on weekdays. The variation by month is depicted below in **Exhibit 8**.

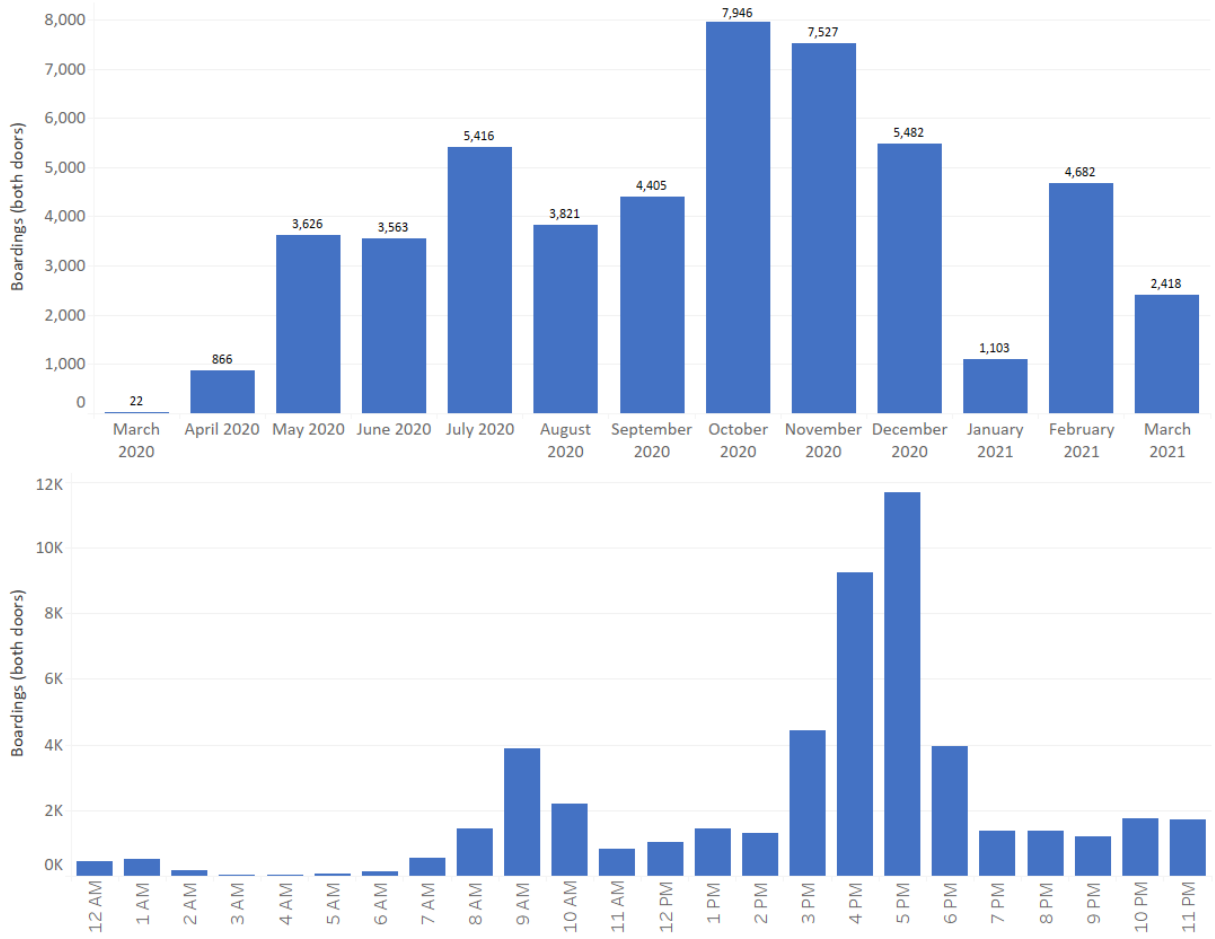
Exhibit 8 – Standby Bus In-Service Hours by Month



Source: Automatic Passenger Counter (APC) dataset, March 1, 2020 through March 18, 2021

The 450 weekday hours operated in November 2020 translates into approximately 21 service hours per day, or roughly equivalent to 3 extra full-time operator runs per weekday, making up an extremely small percentage of the District's overall scheduled service. For context, the District plans to operate roughly 5,000 hours of service every weekday during the upcoming Summer 2021 sign-up.

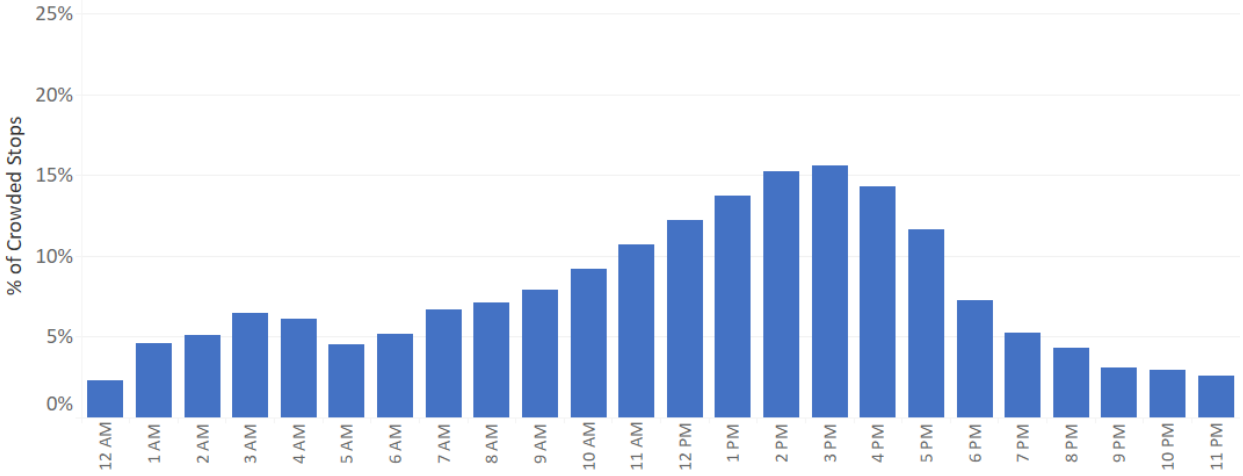
Exhibit 9 – Total Standby Bus Boardings by Month and Time of Day



Source: Automatic Passenger Counter (APC) dataset, March 1, 2020 through March 18, 2021

Detailed crowding data for scheduled service on a trip-by-trip basis have been provided to Transportation staff throughout the pandemic in order to provide informed guidance for operations staff to prioritize the lines and times of day with the most overcrowded trips. A retrospective analysis of these data detailed in **Exhibit 10** demonstrates that crowding on AC Transit service during the pandemic has been most acute from noon to 5:00 p.m.

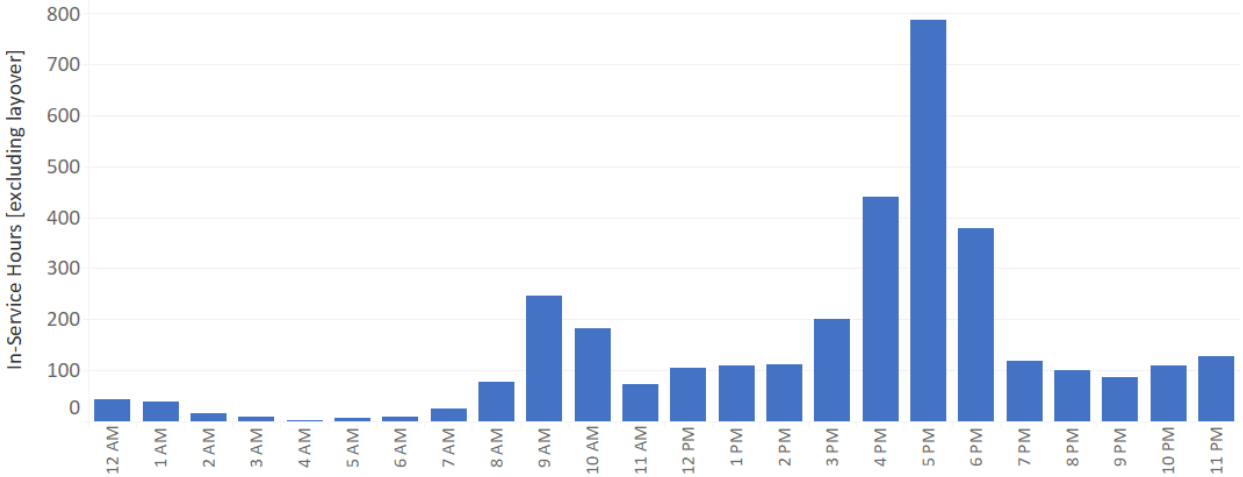
Exhibit 10 – % of Stops Passed by Crowded Buses, grouped by hour, system-wide



Source: Automatic Passenger Counter (APC) dataset, March 1, 2020 through March 18, 2021

However, **Exhibit 11** also shows that the unscheduled extra standby service delivered throughout most of the pandemic has been heavily targeted towards the period between 4:00 p.m. and 7:00 p.m. rather than staggered over the periods of highest demand throughout the day.

Exhibit 11 – Standby Bus In-Service Hours by Time of Day, grouped by hour



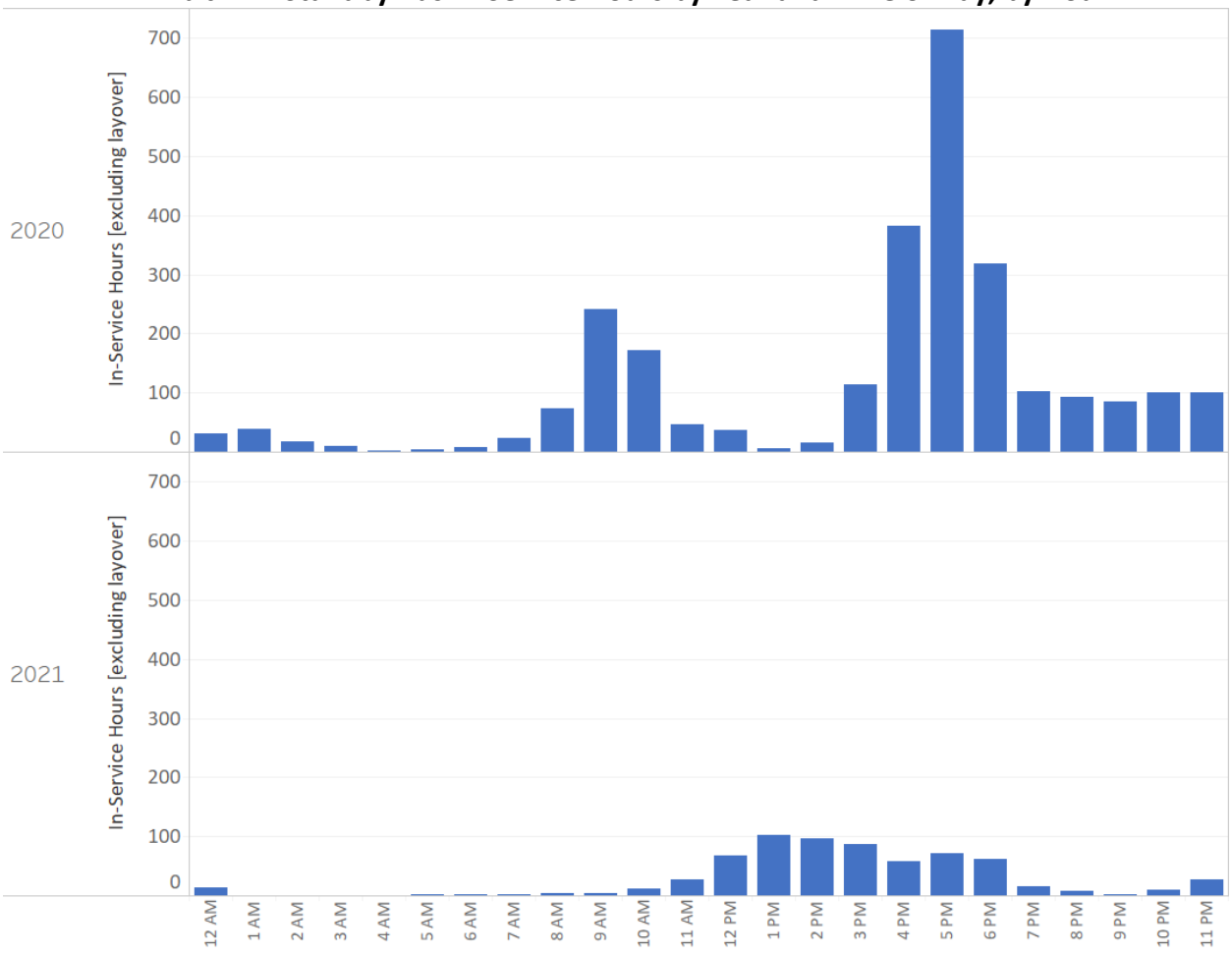
Source: Automatic Passenger Counter (APC) dataset, March 1, 2020 through March 18, 2021

From the beginning of the pandemic through January 2021, the times at which standby service was deployed were continually not in line with actual crowding patterns. Moreover, with the transition into a new operator sign-up, in January 2021, the amount of standby service dispatched by the transportation department declined substantially. From the beginning of the pandemic through January 2021, the District placed transportation staff in the role of responding to demand by dispatching extra service in real-time informed both by recent historical crowding data and by up-to-the-second feedback from operators by way of the District's new Clever Devices CAD/AVL system. These tools were to provide Transportation staff with the information needed to guide the provision additional service where and when it was most needed. However,

the 2020 chart in **Exhibit 12** shows that operating under this procedure did not efficiently address the District's overcrowding issues.

A new simpler procedure introduced in February 2021 largely eschews the investments the District has made in technology and dynamic dispatching. Instead, starting in February, a list of certain all-day scheduled vehicle blocks has been prioritized to be filled according to available workforce. The 2021 chart in **Exhibit 12** shows marginal improvement at being responsive to the actual crowding patterns throughout the day detailed in **Exhibit 10**.

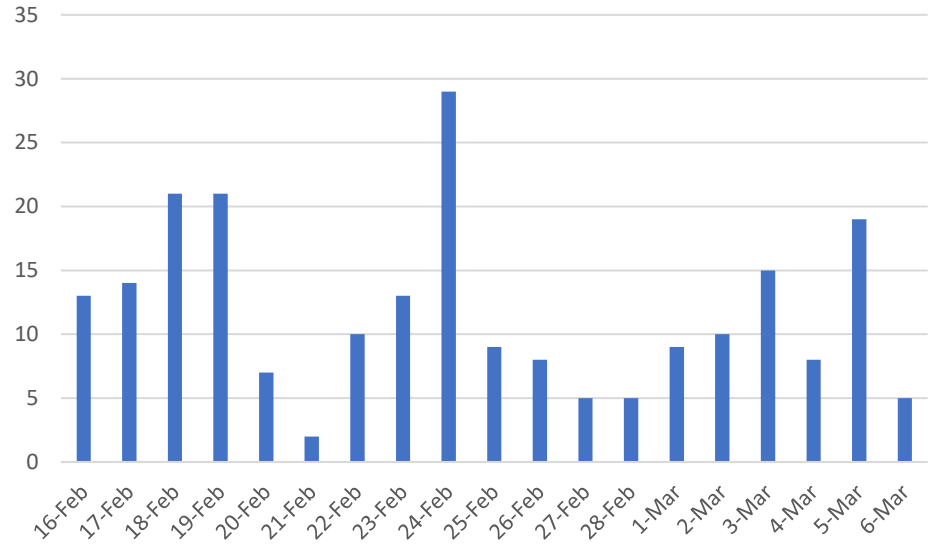
Exhibit 12 – Standby Bus In-Service Hours by Year and Time of Day, by Hour



Source: Automatic Passenger Counter (APC) dataset, March 1, 2020 through March 18, 2021

A sample of actual standby bus assignments tracked by the Operations Control Center between mid-February and early March 2021 is illustrated in **Exhibit 13** below. It shows the District operated 223 standby bus trips to cover overcrowding, ranging from two on Sunday, February 21 to 28 on Wednesday, February 24.

Exhibit 13 – Shadow Bus Assignments: February 16 to March 6, 2021



3 – CHALLENGES

There are four key challenges facing the District with respect to increasing service further to reduce pass-ups: 1) Funding, 2) Service Commitments, 3) Workforce and Training Constraints, and 4) Physical Distancing Requirements.

FUNDING

The one-time funding received from the CARES Act allowed the District to balance its budget at 75% of pre-COVID service levels through June 2021. The funding allocated as part of the subsequent CRRSA Act will allow the District to restore some service in FY 2021-22. The recently passed American Rescue Plan Act will likely bring some additional one-time funding for the District but it is critical the agency has an additional long-term, reliable source of funding to sustain increased service levels. Staff does not want to plan for increased service levels only to have to reduce them after all the federal operating support runs out.

SERVICE COMMITMENTS

AC Transit is operating Supplementary School service as well as a free shuttle to the Coliseum Vaccination Site using resources that would otherwise be used for standby bus service or could be used to increase service on high-ridership lines. In total, these amount to approximately 25-40 operators each day depending on operator unavailability due to excused and unexcused absences.

WORKFORCE AND TRAINING

The District has 1,183 active bus operators as of March 26, 2021. The number of operators needed for daily service delivery at current service levels is 1,132, with another 40-60 operators for Supplementary Service for the remainder of the school year and the standby bus program. The District has also increased the overall extra-board requirement given conditions during the

pandemic have increased the need for covering higher rates of absenteeism. This is reflected in the table below. While the pre-pandemic service levels could be met with 1,338 operators, the new normal will require 1,404, or an additional 66 operators to run the level of service in place prior to March 2020.

Exhibit 14 – Operator Requirement Scenarios

Service Scenario	Service Level	Regular Runs	Extra Board	Total
Pre-Covid	100%	1,021	317	1,338
Emergency Service	75%	800	332	1,132
	85%	882	335	1,217
	90%	926	353	1,279
	95%	972	369	1,341
New Normal	100%	1,021	383	1,404

The District recently resumed hiring and training with the goal of increasing service as funding becomes available but there is a six-month lead time (from initial recruitment to graduation and certification) before operators are available for regular service. In addition, the District currently has an attrition rate of eight operators each month and with current 6-foot physical distancing limits in place, the Training Department can only operate with classes of 12 operators per class. New classes start each month and as many as three classes operate concurrently, graduating about eight operators per month. This means the rate of training will only prevent further loss of operator workforce and won't permit service growth until guidance changes and class sizes can increase.

PHYSICAL DISTANCING

As discussed in SR 21-205, the District is currently limited to about 25% of pre-COVID seating capacity on buses due to the 6-foot physical distancing requirement currently in place. Should public health officials provide guidance that 3-foot distancing is possible without posing additional risk to operators or passengers, the capacity of the system could double, going a long way toward resolving pass-ups.

APPENDIX 1 – OVERLOADED LINES REPORT

Route	Count of Overload Trips			Pct of Overloaded Trips
	NO	YES	Grand Total	
1T	1,030	1,414	2,444	57.9%
72	427	542	969	55.9%
72M	452	483	935	51.7%
72R	857	757	1,614	46.9%
51A	1,590	679	2,269	29.9%
76	528	203	731	27.8%
20	715	223	938	23.8%
86	708	211	919	23.0%
96	386	114	500	22.8%
18	918	263	1,181	22.3%
19	129	36	165	21.8%
801	241	64	305	21.0%
40	2,057	528	2,585	20.4%
6	1,660	414	2,074	20.0%
U	73	18	91	19.8%
97	1,378	321	1,699	18.9%
14	1,275	295	1,570	18.8%
51B	1,374	313	1,687	18.6%
34	368	77	445	17.3%
35	390	78	468	16.7%
10	1,427	285	1,712	16.6%
71	355	66	421	15.7%
21	423	77	500	15.4%
LA	24	4	28	14.3%
NX1	6	1	7	14.3%
62	1,294	203	1,497	13.6%
12	522	81	603	13.4%
36	555	66	621	10.6%
73	1,710	200	1,910	10.5%
70	360	42	402	10.4%
28	404	39	443	8.8%
706	11	1	12	8.3%
99	1,461	132	1,593	8.3%
88	1,109	99	1,208	8.2%
56	337	25	362	6.9%
840	113	8	121	6.6%
57	1,255	88	1,343	6.6%
41	427	29	456	6.4%
33	1,163	76	1,239	6.1%
800	192	12	204	5.9%
45	975	60	1,035	5.8%

Route	Count of Overload Trips			Pct of Overloaded Trips
	NO	YES	Grand Total	
F	902	51	953	5.4%
29	499	28	527	5.3%
805	109	6	115	5.2%
93	448	24	472	5.1%
210	763	39	802	4.9%
200	795	39	834	4.7%
NL	1,400	65	1,465	4.4%
74	575	26	601	4.3%
79	241	10	251	4.0%
39	343	14	357	3.9%
7	248	9	257	3.5%
98	1,299	41	1,340	3.1%
54	1,714	48	1,762	2.7%
90	1,201	30	1,231	2.4%
239	667	15	682	2.2%
W	46	1	47	2.1%
60	620	13	633	2.1%
67	144	3	147	2.0%
376	243	5	248	2.0%
O	826	14	840	1.7%
851	119	2	121	1.7%
52	331	5	336	1.5%
802	139	2	141	1.4%
217	763	10	773	1.3%
212	449	4	453	0.9%
251	253	2	255	0.8%
232	320	2	322	0.6%
216	312	1	313	0.3%
65	47		47	0.0%
95	419		419	0.0%
P	22		22	0.0%
J	27		27	0.0%
G	5		5	0.0%
LA	6		6	0.0%
V	3		3	0.0%
46L	246		246	0.0%
701	5		5	0.0%
702	4		4	0.0%
NX	24		24	0.0%
NX2	24		24	0.0%

APPENDIX 2 – OVERCROWDED BLOCKS REPORT

Division	Block	Count of Overloaded Trips			Pct of Overloaded Trips
		NO	YES	Grand Total	
D2	800001	2	2	4	50.0%
D2	800003	9	6	15	40.0%
D2	6008	74	36	110	32.7%
D2	151004	182	72	254	28.3%
D2	151001	163	62	225	27.6%
D2	18004	139	52	191	27.2%
D2	12005	79	29	108	26.9%
D2	19002	29	10	39	25.6%
D2	96004	61	21	82	25.6%
D2	12004	32	11	43	25.6%
D2	6007	187	64	251	25.5%
D2	18003	119	40	159	25.2%
D3	72016	11	44	55	80.0%
D3	72004	46	72	118	61.0%
D3	72005	55	78	133	58.6%
D3	72007	47	65	112	58.0%
D3	72011	42	57	99	57.6%
D3	72014	48	64	112	57.1%
D3	72013	59	74	133	55.6%
D3	72015	42	52	94	55.3%
D3	72003	66	81	147	55.1%
D3	372012	31	38	69	55.1%
D4	301017	43	103	146	70.5%
D4	301005	48	113	161	70.2%
D4	301013	45	104	149	69.8%
D4	301014	45	99	144	68.8%
D4	301010	46	94	140	67.1%
D4	301018	48	94	142	66.2%
D4	301020	42	67	109	61.5%
D4	301009	56	87	143	60.8%
D4	301001	31	47	78	60.3%
D4	301002	28	39	67	58.2%
D6	136003	4	10	14	71.4%
D6	801004	24	25	49	51.0%
D6	136002	7	4	11	36.4%
D6	801003	47	22	69	31.9%
D6	86001	200	87	287	30.3%
D6	97005	99	35	134	26.1%
D6	97003	118	40	158	25.3%
D6	97004	160	54	214	25.2%
D6	10004	163	54	217	24.9%
D6	97013	16	5	21	23.8%
D6	35002	141	42	183	23.0%