
CHAPTER 3

BLOCKING

Advanced Section

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I. Introduction

In urban settings, routes are seldom designed to offer the same headway and running time throughout the day. Most urban routes are designed with complexities that include multiple terminals, variable running times, headway variations between peak and midday service, "extra" trips for school service, mid-route recovery at a timed transfer or rail station location and route interlining. Route 110, containing many of these complexities, will be blocked in this chapter.

The basic skills involved in blocking a more complex route are the same as for a simple route. Trips are "hooked" or linked together into vehicle assignments based on the requirement for layover and recovery time and the goal of minimizing the number of required vehicles. It is necessary to keep in mind a few basic rules when blocking these more complex routes:

II. Basic Blocking Rules

- **Route variations are generally interlined only at common terminals.** For example, departing Route 110 trips from the common terminal DVC may serve any of the three route variations. Route 110 has two principal pull-on and pull-off terminals, one at DVC and one at the rail station (CON). Most trips serve both terminals, but peak trips may begin or end at the rail station. There are two "outer" terminals, one at Washington and Clayton (WAS) and one at Marsh Creek Circle (MCC). Trips that arrive at a particular terminal would leave from that terminal in revenue service, rather than deadheading from one terminal to another.
- **For a route with multiple terminals, it is desirable to make space for more than one terminal on the blocking sheet.** A recommended format follows the Route 110 master schedule shown in the following pages.
- **Some blocks are likely to operate only during peak service,** while other blocks will provide service throughout the day. When initially linking trips into a block, trips are hooked until there is either too little recovery time to comply with labor contract requirements or too much recovery time to be economically viable. Some peak blocks may make only a single trip to augment peak period service or to add service during school peaks. Although single trips may serve an important need, single trip blocks are costly, especially when they require a dedicated peak vehicle. Interlining with another block is almost always desirable.
- **It is not necessary to provide recovery time at both ends of the route.** For Route 110, recovery is generally made at DVC or the rail station (CON). Since this route is designed to meet trains, some layover is planned at the rail station regardless of whether this is actually a terminal for some trips. A target total of between 5 and 10 minutes of layover is to be included for each round trip, including time given at DVC, the outer terminals and the rail station.
- **Tracking trip assignments to blocks on the master schedule** reduces the chance of error. A common mistake occurs when the scheduler inadvertently misses single trips in the blocking thread. If not caught in time, this could result in extensive reworking.

The following pages contain the master schedule (headway sheet) for Route 110 (by direction) and a blocking sheet form which displays multiple terminals. The initial set of blocks will be developed from the master schedule and recorded on the blocking sheet form.

A. Route 110 master schedule - westbound

Trip #	Via	Lv MCC	Lv WAS	MYV	CKP	CLA	CLT	Arr CON	Lv CON	FRY	Arr DVC
1W	K		5:04		5:13	5:17	5:22	5:30	5:33	5:38	5:49
2W	P		5:21	5:28		5:32	5:37	5:45	5:48	5:53	6:04
3W	K		5:31		5:40	5:45	5:51	6:00	6:03	6:09	6:21
4W	M	5:43	5:57			6:00	6:06	6:15	6:18	6:24	6:36
5W	P		6:02	6:10		6:15	6:21	6:30	6:33	6:39	6:51
6W	K		6:11		6:20	6:25	6:31	6:40	6:43	6:49	7:01
7W	M	6:18	6:32			6:35	6:41	6:50	6:55	7:01	7:13
8W	P		6:32	6:40		6:45	6:51	7:00	7:05	7:11	7:23
9W	K		6:41		6:50	6:55	7:01	7:10	7:15	7:21	7:33
10W	M	6:48	7:02			7:05	7:11	7:20	7:25	7:31	7:43
11W	P		7:02	7:10		7:15	7:21	7:30	7:35	7:41	7:53
12W	K		7:11		7:20	7:25	7:31	7:40	7:45	7:51	8:03
13W	M	7:24	7:38			7:41	7:46	7:55	8:00	8:06	8:18
14W	P		7:39	7:47		7:52	7:58	8:07	8:15	8:21	8:34
15W	K		7:55		8:04	8:09	8:15	8:24	Out of service		
16W	M	8:00	8:14			8:17	8:23	8:32	8:35	8:41	8:54
17W	P		8:09	8:17		8:23	8:29	8:38	Out of service		
18W	P		8:14	8:21		8:27	8:33	8:42	8:55	9:01	9:14
19W	K		8:29		8:38	8:42	8:47	8:56	Out of service		
20W	M	8:40	8:54			8:57	9:02	9:11	9:13	9:19	9:32
21W	P		9:00	9:07		9:11	9:16	9:25	Out of service		
22W	K		9:11		9:20	9:24	9:29	9:38	9:40	9:46	9:59
23W	M	9:29	9:41			9:44	9:49	9:58	10:00	10:06	10:19
24W	P		9:53	10:00		10:04	10:09	10:18	10:20	10:26	10:39
25W	K		10:11		10:20	10:24	10:29	10:38	10:40	10:46	10:59
26W	M	10:29	10:41			10:44	10:49	10:58	11:00	11:06	11:19
27W	P		10:52	10:59		11:03	11:09	11:18	11:20	11:25	11:37
28W	K		11:10		11:19	11:23	11:29	11:38	11:40	11:45	11:57
29W	M	11:29	11:40			11:43	11:49	11:58	12:00	12:05	12:17
30W	P		11:52	11:59		12:03	12:09	12:18	12:20	12:25	12:37
31W	K		12:10		12:19	12:23	12:29	12:38	12:40	12:45	12:57
32W	M	12:29	12:40			12:43	12:49	12:58	1:00	1:05	1:17
33W	P		12:52	12:59		1:03	1:09	1:18	1:20	1:25	1:37
34W	K		1:10		1:19	1:23	1:29	1:38	1:40	1:45	1:57
35W	M	1:29	1:40			1:43	1:49	1:58	2:00	2:05	2:18
36W	P		1:52	1:59		2:03	2:09	2:18	2:20	2:25	2:38
37W	K		2:09		2:18	2:23	2:29	2:39	2:40	2:45	2:58
38W	M	2:32	2:40			2:43	2:49	2:59	3:04	3:09	3:22
39W	K		2:44S		2:51S						
40W	P		2:54	3:03		3:07	3:13	3:23	3:25	3:30	3:43
41W	K		3:12		3:21	3:26	3:32	3:42	3:47	3:52	4:05
42W	M	3:36	3:44			3:47	3:53	4:03	4:05	4:10	4:23
43W	P		3:54	4:03		4:07	4:13	4:23	4:25	4:30	4:43
44W	K		4:13		4:22	4:27	4:33	4:43	4:46	4:51	5:04
45W	M	4:36	4:44			4:47	4:53	5:03	5:05	5:10	5:23
46W	P		4:45	4:53		4:57	5:03	5:13	5:15	5:21	5:34
47W	K		4:50		4:59	5:04	5:10	5:20	5:25	5:31	5:44
48W	--								5:35	5:41	5:54
49W	M	5:15	5:23			5:27	5:33	5:43	5:45	5:51	6:04
50W	P		5:25	5:33		5:37	5:43	5:53	5:55	6:01	6:14
51W	K		5:33		5:42	5:47	5:53	6:03	6:05	6:11	6:24
52W	M	5:45	5:53			5:57	6:03	6:13	6:15	6:21	6:34
53W	P		5:55	6:03		6:07	6:13	6:23	6:25	6:31	6:44
54W	K		6:03		6:12	6:17	6:23	6:33	6:35	6:41	6:54
55W	M	6:15	6:23			6:27	6:33	6:43	6:45	6:51	7:04
56W	P		6:25	6:33		6:37	6:43	6:53	6:55	7:01	7:14
57W	K		6:33		6:42	6:47	6:53	7:03	7:05	7:11	7:24
58W	M	6:45	6:53			6:57	7:03	7:11	7:15	7:20	7:31
59W	P		6:55	7:03		7:07	7:13	7:21	7:25	7:30	7:41
60W	K		7:07		7:15	7:19	7:24	7:32	Out of service		
61W	M	7:23	7:31			7:34	7:39	7:47	7:50	7:55	8:06
62W	P		7:28	7:35		7:39	7:44	7:52	Out of service		
63W	K		7:42		7:50	7:54	7:59	8:07	8:10	8:15	8:26
64W	M	8:00	8:08			8:11	8:16	8:24	Out of service		
65W	P		8:14	8:21		8:25	8:30	8:38	8:40	8:45	8:56
66W	K		8:37		8:45	8:49	8:53	9:01	9:10	9:15	9:26
67W	M	9:00	9:08			9:11	9:16	9:24			
68W	P		9:24	9:31		9:35	9:40	9:48	9:50	9:55	10:06
69W	K		9:53		10:01	10:05	10:10	10:18	Out of service		
70W	P		10:24	10:31		10:35	10:40	10:48	Out of service		
71W	K		10:53		11:01	11:05	11:10	11:18	Out of service		

Route 110 /WESTbound

B. Route 110 master schedule - eastbound

Trip #	Via	Lv DVC	CLD	Arr CON	Lv CON	CLT	CLA	CKP	MYV	Arr WAS	Arr MCC
1E	P				4:43	4:49	4:53		4:57	5:04	
2E	K				4:59	5:05	5:09	5:13		5:21	
3E	P				5:05	5:11	5:15		5:19	5:27	
4E	M				5:21	5:27	5:31			5:34	5:42
5E	K				5:36	5:44	5:49	5:53		6:02	
6E	P				5:45	5:53	5:58		6:03	6:11	
7E	M	5:30	5:40	5:46	5:52	6:00	6:05			6:09	6:17
8E	K	5:44	5:55	6:02	6:06	6:14	6:19	6:23		6:32	
9E	P	5:54	6:05	6:12	6:15	6:23	6:28		6:33	6:41	
10E	M	6:00	6:11	6:18	6:22	6:30	6:35			6:39	6:47
11E	K	6:14	6:25	6:32	6:36	6:44	6:49	6:53		7:02	
12E	P	6:23	6:34	6:41	6:45	6:53	6:58		7:03	7:11	
13E	M	6:38	6:49	6:56	6:58	7:06	7:11			7:15	7:23
14E	K	6:53	7:04	7:11	7:13	7:21	7:26	7:30		7:39	
15E	P	7:08	7:19	7:26	7:29	7:37	7:42		7:47	7:55	
16E	M	7:14	7:25	7:32	7:34	7:42	7:47			7:47	7:55
17E	K	7:24	7:35	7:42	7:43	7:51	7:56	8:00		8:09	
18E	K	7:34	7:45	7:52	7:53	8:00	8:04	8:07		8:14	
19E	P	7:44	7:55	8:02	8:04	8:12	8:17		8:22	8:29	
20E	M	7:55	8:06	8:13	8:15	8:23	8:28			8:32	8:40
21E	K	8:10	8:21	8:28	8:30	8:38	8:43	8:47		8:55	
22E	P	8:25	8:36	8:43	8:45	8:53	8:58		9:02	9:09	
23E	M	8:45	8:56	9:03	9:05	9:13	9:18			9:21	9:29
24E	K	9:05	9:16	9:23	9:25	9:33	9:38	9:42		9:50	
25E	P	9:25	9:36	9:43	9:45	9:53	9:58		10:02	10:09	
26E	M	9:45	9:56	10:03	10:05	10:13	10:18			10:21	10:29
27E	K	10:05	10:16	10:22	10:25	10:38	10:42	10:42		10:50	
28E	P	10:25	10:36	10:42	10:45	10:53	10:58		11:02	11:09	
29E	M	10:45	10:56	11:02	11:05	11:13	11:18			11:21	11:29
30E	K	11:05	11:16	11:22	11:25	11:33	11:38	11:42		11:50	
31E	P	11:25	11:36	11:42	11:45	11:53	11:58		12:02	12:09	
32E	M	11:45	11:56	12:02	12:05	12:13	12:18			12:21	12:29
33E	K	12:05	12:16	12:22	12:25	12:33	12:38	12:42		12:49	
34E	P	12:25	12:36	12:42	12:45	12:53	12:58		1:02	1:09	
35E	M	12:45	12:56	1:02	1:05	1:13	1:18			1:21	1:29
36E	K	1:05	1:16	1:22	1:25	1:33	1:38	1:42		1:49	
37E	P	1:25	1:36	1:42	1:45	1:53	1:58		2:02	2:09	
38E	M	1:45	1:56	2:02	2:05	2:13	2:18			2:21	2:29
39E	K	2:01	2:14	2:21	2:24	2:33	2:39	2:44		2:54	
40E	P	2:20	2:33	2:40	2:43	2:52	2:58		3:03	3:12	
41E	M	2:40	2:53	3:00	3:03	3:12	3:18			3:22	3:36
42E	K	3:00	3:13	3:20	3:24	3:33	3:39	3:44		3:54	
43E	P	3:20	3:33	3:40	3:44	3:53	3:59		4:04	4:13	
44E	M	3:40	3:53	4:00	4:02	4:11	4:17			4:21	4:35
45E	K				4:12	4:22	4:29	4:34		4:44	
46E	P	3:55	4:08	4:16	4:20	4:30	4:37		4:42	4:50	
47E	M	4:15	4:28	4:36	4:40	4:50	4:57			5:00	5:14
48E	K				4:50	5:00	5:07	5:12		5:22	
49E	P	4:35	4:48	4:56	5:00	5:10	5:17		5:22	5:30	
50E	M				5:10	5:20	5:27			5:30	5:44
51E	K	4:55	5:08	5:16	5:20	5:30	5:37	5:42		5:52	
52E	P				5:30	5:40	5:47		5:52	6:00	
53E	M	5:15	5:28	5:36	5:40	5:50	5:57			6:00	6:14
54E	K	5:25	5:38	5:46	5:50	6:00	6:07	6:12		6:22	
55E	P	5:35	5:48	5:56	6:00	6:10	6:17		6:22	6:30	
56E	M	5:45	5:58	6:00	6:10	6:20	6:27			6:30	6:44
57E	K	5:55	6:08	6:16	6:20	6:30	6:37	6:42		6:52	
58E	P	6:05	6:18	6:26	6:30	6:40	6:47		6:52	7:00	
59E	M	6:20	6:33	6:41	6:45	6:55	7:02			7:05	7:17
60E	P	6:35	6:48	6:56	7:00	7:07	7:12	7:16		7:24	
61E	K	6:50	7:03	7:11	7:15	7:22	7:27		7:31	7:38	
62E	M	7:10	7:21	7:27	7:30	7:37	7:42			7:45	7:57
63E	K	7:30	7:41	7:47	7:50	7:57	8:02	8:06		8:14	
64E	P	7:50	8:01	8:07	8:10	8:17	8:22		8:26	8:33	
65E	M	8:10	8:21	8:27	8:30	8:37	8:42			8:45	8:57
66E	K	8:40	8:51	8:57	9:00	9:07	9:12	9:16		9:24	
67E	P	9:10	9:21	9:27	9:30	9:37	9:42		9:46	9:53	
68E	K	9:40	9:51	9:57	10:00	10:07	10:12	10:16		10:24	
69E	P	10:10	10:21	10:27	10:30	10:37	10:42		10:46	10:53	

Route 110 /EASTbound

III. Beginning the Blocking Process for Route 110

The first eastbound Route 110 trip 1E leaves the rail station (CON) at 4:43 a.m., arriving at Washington and Clayton (WAS) at 5:04 a.m. Trip 1W departs from WAS at 5:04 a.m., arriving at DVC at 5:49 a.m. By taking no layover at WAS, 1E can be hooked to 1W and together form the first two trips of Block 1. Logical hooks for Block 1 continue as shown and are summarized on the blocking sheet that follows. The hooks occur smoothly because blocking considerations were taken into account by the scheduler during the trip generation process.

Trip #	Via	Lv DVC	CLD	Arr CON	Lv CON	CLT	CLA	CKP	MYV	Arr WAS	Arr MCC
1E	P				4:43	4:49	4:53		4:57	5:04	
2E	K				4:59	5:05	5:09	5:13		5:21	
3E	P				5:05	5:11	5:15		5:19	5:27	
4E	M				5:21	5:27	5:31			5:34	5:42
5E	K				5:36	5:44	5:49	5:53		6:02	
6E	P				5:45	5:53	5:58		6:03	6:11	
7E	M	5:30	5:40	5:46	5:52	6:00	6:05			6:09	6:17
8E	K	5:44	5:55	6:02	6:06	6:14	6:19	6:23		6:32	
9E	P	5:54	6:05	6:12	6:15	6:23	6:28		6:33	6:41	
10E	M	6:00	6:11	6:18	6:22	6:30	6:35			6:39	6:47
11E	K	6:14	6:25	6:32	6:36	6:44	6:49	6:53		7:02	
12E	P	6:23	6:34	6:41	6:45	6:53	6:58		7:03	7:11	
13E	M	6:38	6:49	6:56	6:58	7:06	7:11			7:15	7:23
14E	K	6:53	7:04	7:11	7:13	7:21	7:26	7:30		7:39	
15E	P	7:08	7:19	7:26	7:29	7:37	7:42		7:47	7:55	
16E	M	7:14	7:25	7:32	7:34	7:42	7:47			7:47	7:55
17E	K	7:24	7:35	7:42	7:43	7:51	7:56	8:00		8:09	
18E	K	7:34	7:45	7:52	7:53	8:00	8:04	8:07		8:14	
19E	P	7:44	7:55	8:02	8:04	8:12	8:17		8:22	8:29	
20E	M	7:55	8:06	8:13	8:15	8:23	8:28			8:32	8:40
21E	K	8:10	8:21	8:28	8:30	8:38	8:43	8:47		8:55	
22E	P	8:25	8:36	8:43	8:45	8:53	8:58		9:02	9:09	
23E	M	8:45	8:56	9:03	9:05	9:13	9:18			9:21	9:29
24E	K	9:05	9:16	9:23	9:25	9:33	9:38	9:42		9:50	
25E	P	9:25	9:36	9:43	9:45	9:53	9:58		10:02	10:09	
26E	M	9:45	9:56	10:03	10:05	10:13	10:18			10:21	10:29
27E	K	10:05	10:16	10:23	10:25	10:33	10:38	10:42		10:50	
28E	P	10:25	10:36	10:42	10:45	10:53	10:58		11:02	11:09	
29E	M	10:45	10:56	11:02	11:05	11:13	11:18			11:21	11:29

Trip #	Via	Lv MCC	Lv WAS	MYV	Arr CKP	CLA	CLT	Arr CON	Lv CON	FRY	Arr DVC
1W	K		5:04		5:13	5:17	5:22	5:30	5:33	5:38	5:49
2W	P		5:21	5:28		5:32	5:37	5:45	5:48	5:53	6:04
3W	K		5:31		5:40	5:45	5:51	6:00	6:03	6:09	6:21
4W	M	5:43	5:57		6:00	6:06	6:15	6:18	6:24	6:36	
5W	P		6:02	6:10		6:15	6:21	6:30	6:33	6:39	6:51
6W	K		6:11		6:20	6:25	6:31	6:40	6:43	6:49	7:01
7W	M	6:18	6:32		6:35	6:41	6:50	6:55	7:01	7:13	
8W	P		6:41	6:40		6:45	6:51	7:00	7:05	7:11	7:23
9W	K		6:41		6:50	6:55	7:01	7:10	7:15	7:21	7:33
10W	M	6:48	7:02		7:05	7:11	7:20	7:25	7:31	7:43	
11W	P		7:02	7:10		7:15	7:21	7:30	7:35	7:41	7:53
12W	K		7:11		7:20	7:25	7:31	7:40	7:45	7:51	8:03
13W	M	7:24	7:38		7:41	7:46	7:55	8:00	8:06	8:18	
14W	P		7:39	7:47		7:52	7:58	8:07	8:15	8:21	8:34
15W	K		7:55		8:04	8:09	8:15	8:24	Out of service		
16W	M	8:00	8:14		8:17	8:23	8:32	8:35	8:41	8:54	
17W	P		8:09	8:17		8:23	8:29	8:38	Out of service		
18W	P		8:14	8:21		8:27	8:33	8:42	8:55	9:01	9:14
19W	K		8:29		8:38	8:42	8:47	8:56	Out of service		
20W	M	8:40	8:54		8:57	9:02	9:11	9:13	9:19	9:32	
21W	P		9:00	9:07		9:11	9:16	9:25	Out of service		
22W	K		9:11		9:20	9:24	9:29	9:38	9:40	9:46	9:59
23W	M	9:29	9:41		9:44	9:49	9:58	10:00	10:06	10:19	
24W	P		9:53	10:00		10:04	10:09	10:18	10:20	10:26	10:39
25W	K		10:11		10:20	10:24	10:29	10:38	10:40	10:46	10:59
26W	M	10:29	10:41		10:44	10:49	10:58	11:00	11:06	11:19	
27W	P		10:52	10:59		11:03	11:09	11:18	11:20	11:25	11:37
28W	K		11:10		11:19	11:23	11:29	11:38	11:40	11:45	11:57

Blocking Route 110 begins with Block 1.

Advanced Chapter 3/ Blocking

Completing Block 1 Route 110

Trip #	Via	Lv DVC	CLD	Arr CON	Lv CON	CLT	CLA	CKP	MYV	Arr WAS	Arr MCC
30E	K	11:05	11:16	11:22	11:25	11:33	11:38	11:42		11:50	
31E	P	11:25	11:36	11:42	11:45	11:53	11:58		12:02	12:09	
32E	M	11:45	11:56	12:02	12:05	12:13	12:18			12:27	12:29
33E	K	12:05	12:16	12:22	12:25	12:33	12:38	12:42		12:49	
34E	P	12:25	12:36	12:42	12:45	12:53	12:58		1:02	1:09	
35E	M	12:45	12:56	1:02	1:05	1:13	1:18			1:21	1:29
36E	K	1:05	1:16	1:22	1:25	1:33	1:38	1:42		1:49	
37E	P	1:25	1:36	1:42	1:45	1:53	1:58		2:02	2:09	
38E	M	1:45	1:56	2:02	2:05	2:13	2:18			2:21	2:29
39E	K	2:01	2:14	2:21	2:24	2:33	2:39	2:44		2:54	
40E	P	2:20	2:33	2:40	2:43	2:52	2:58		3:03	3:10	
41E	M	2:40	2:53	3:00	3:03	3:12	3:18			3:22	3:36
42E	K	3:00	3:13	3:20	3:24	3:33	3:39	3:44		3:54	
43E	P	3:20	3:33	3:40	3:44	3:53	3:59		4:04	4:13	
44E	M	3:40	3:53	4:00	4:02	4:11	4:17			4:21	4:35
45E	K				4:12	4:22	4:29	4:34		4:44	
46E	P	3:55	4:08	4:16	4:20	4:30	4:37		4:42	4:50	
47E	M	4:15	4:28	4:36	4:40	4:50	4:57			5:00	5:14
48E	K				4:50	5:00	5:07	5:12		5:22	
49E	P	4:35	4:48	4:56	5:00	5:10	5:17		5:22	5:30	
50E	M				5:10	5:20	5:27			5:30	5:44
51E	K	4:55	5:08	5:16	5:20	5:30	5:37	5:42		5:52	
52E	P				5:30	5:40	5:47		5:52	6:00	
53E	M	5:15	5:28	5:36	5:40	5:50	5:57			6:00	6:14
54E	K	5:25	5:38	5:46	5:50	6:00	6:07	6:12		6:22	
55E	P	5:35	5:48	5:56	6:00	6:10	6:17		6:22	6:30	
56E	M	5:45	5:58	6:00	6:10	6:20	6:27			6:30	6:44
57E	K	5:55	6:08	6:16	6:20	6:30	6:37	6:42		6:52	
58E	P	6:05	6:18	6:26	6:30	6:40	6:47		6:52	7:00	

Trip #	Via	Lv MCC	Lv WAS	MYV	CKP	CLA	CLT	Arr CON	Lv CON	FRY	Arr DVC
29W	M	11:29	11:40			11:43	11:49	11:58	12:00	12:05	12:17
30W	P		11:57	11:59		12:03	12:09	12:18	12:20	12:25	12:37
31W	K		12:10		12:19	12:23	12:29	12:38	12:40	12:45	12:57
32W	M	12:29	12:40			12:43	12:49	12:58	1:00	1:05	1:17
33W	P		12:52	12:59		1:03	1:09	1:18	1:20	1:25	1:37
34W	K		1:10		1:19	1:23	1:29	1:38	1:40	1:45	1:57
35W	M	1:29	1:40			1:43	1:49	1:58	2:00	2:05	2:18
36W	P		1:52	1:59		2:03	2:09	2:18	2:20	2:25	2:38
37W	K		2:09		2:18	2:23	2:29	2:39	2:40	2:45	2:58
38W	M	2:32	2:40			2:43	2:49	2:59	3:04	3:09	3:22
39W	K		2:44		2:51						
40W	P		2:54	3:03		3:07	3:13	3:23	3:25	3:30	3:43
41W	K		3:12		3:21	3:26	3:32	3:42	3:47	3:52	4:05
42W	M	3:36	3:44			3:47	3:53	4:03	4:05	4:10	4:23
43W	P		3:54	4:03		4:07	4:13	4:23	4:25	4:30	4:43
44W	K		4:13		4:22	4:27	4:33	4:43	4:46	4:51	5:04
45W	M	4:36	4:44			4:47	4:53	5:03	5:05	5:10	5:23
46W	P		4:45	4:53		4:57	5:03	5:13	5:15	5:21	5:34
47W	K		4:50		4:59	5:04	5:10	5:20	5:25	5:31	5:44
48W	--								5:35	5:41	5:54
49W	M	5:15	5:23			5:27	5:33	5:43	5:45	5:51	6:04
50W	P		5:25	5:33		5:37	5:43	5:53	5:55	6:01	6:14
51W	K		5:33		5:42	5:47	5:53	6:03	6:05	6:11	6:24
52W	M	5:45	5:53			5:57	6:03	6:13	6:15	6:21	6:34
53W	P		5:55	6:03		6:07	6:13	6:23	6:25	6:31	6:44
54W	K		6:03		6:12	6:17	6:23	6:33	6:35	6:41	6:54
55W	M	6:15	6:23			6:27	6:33	6:43	6:45	6:51	7:04
56W	P		6:25	6:33		6:37	6:43	6:53	6:55	7:01	7:14
57W	K		6:38		6:42	6:47	6:53	7:03	7:05	7:11	7:24
58W	M	6:45	6:53			6:57	7:03	7:11	7:15	7:20	7:31
59W	P		6:55	7:03		7:07	7:13	7:21	7:25	7:30	7:41
60W	K		7:07		7:15	7:19	7:24	7:32			
61W	M	7:23	7:31			7:34	7:39	7:47	7:50	7:55	8:06

Route 110 Block 1 is completed.

Notes:

- A target of at least 4 minutes of "internal" recovery time has been provided for each round trip at the rail station (CON) during the trip building process. This availability of internal recovery time makes it possible to minimize recovery at the eastern and western terminals and still meet contractual layover requirements.
- Block 1 switches from the Washington @ Clayton (WAS) branches to the Marsh Creek Circle (MCC) branch as per the route design and because of the way the scheduler has made decisions regarding the layover allocations. The vehicle assigned to Block 1 can change between route branches at the common terminal DVC.
- When arrival and departure times are the same, the terminal is treated as a simple stop, with no recovery at that location.
- On the blocking sheet that follows, the terminal locations have been customized to name the exact location rather than "outer" and "inner" terminals.

A. Blocking sheet completed for Route 110, Block 1

BLOCKING SHEET								
Multiple Terminals								
Route #: 110				Special Instructions: 5 - 10 min. recovery/ layover. Consider internal layover at rail station as part of total amount required.				
Date: xx/xx/xx								
Scheduler: BN								
Block No.	Westbound				Eastbound			
	Depart Wash/ Clay (WAS)	Depart Marsh Crk Cr (MCC)	Arrive Rail Station (CON)	Arrive DVC	Depart DVC	Depart Rail Station (CON)	Arrive Wash/ Clay (WAS)	Arrive Marsh Crk Cr (MCC)
1						4:43A	5:04A	
1	5:04			5:49	5:54		6:41	
1	6:41			7:33	7:34		8:14	
1	8:14			9:14	9:25		10:09	
1	10:11			10:59	11:05		11:50	
1	11:52A			12:37P	12:45P			1:29P
1		1:29		2:18	2:20		3:12	
1	3:12			4:05	4:15			5:14
1		5:15		6:04	6:05		7:00	
1	7:07P		7:32P					

Eighteen Route 110 one-way trips make up Block 1.

Block 1 is an all day (base) block that begins at the rail station. During the course of the day, Block 1 provides some trips to the Washington and Clayton (WAS) terminal and some to the Marsh Creek Circle terminal. The operator will simply change the destination sign (headsign) at the DVC terminal before turning around.

B. Block 2, Route 110

The second block (Block 2) derived from the master schedule also provides all day service, operating nearly 15 hours in revenue service. Block 3 operates in the morning only.

BLOCKING SHEET								
Route #: 110		Special Instructions: 5 - 10 min. recovery/ layover. Consider internal layover at rail station as part of total amount required.						
Date: xx/xx/xx								
Scheduler: BN								
Block No.	Westbound				Eastbound			
	Depart Wash/ Clay (WAS)	Depart Marsh Crk Cr (MCC)	Arrive Rail Station (CON)	Arrive DVC	Depart DVC	Depart Rail Station (CON)	Arrive Wash/ Clay (WAS)	Arrive Marsh Crk Cr (MCC)
2						4:59A	5:21A	
2	5:21			6:04	6:14		7:02	
2	7:02			7:53	7:55			8:40
2		8:40		9:32	9:45			10:29
2		10:29A		11:19A	11:25A		12:09P	
2	12:10			12:57	1:05		1:49	
2	1:52			2:38	2:40			3:36
2		3:36		4:23	4:35		5:30	
2	5:33			6:24	6:35		7:24	
2	7:28P		7:52P					
3						5:05A	5:27A	
3	5:31			6:21	6:23		7:11	
3	7:11			8:03	8:10		8:55	
3	9:00A		9:25A					

The blocking of Route 110 continues with the completion of Blocks 2 and 3.

Several considerations come into play while continuing the blocking of Route 110:

- 1) Trips begin at more than one location. For example, while most of the morning pull-outs begin revenue service at the rail station, some begin at DVC.
- 2) Route 110 contains school tripper service which requires a vehicle to operate just one trip (or partial trip). On the master schedule, the school trip is marked with an S.
- 3) Some blocks will operate all day, while others will operate during just one peak period.

C. Completing the blocks for Route 110

BLOCKING SHEET								
Route #: 110					Special Instructions: 5 - 10 min. recovery/ layover. Consider internal layover at rail station as part of total amount required.			
Date: xx/xx/xx								
Scheduler: BN								
Block No.	Westbound				Eastbound			
	Depart Wash/ Clay (WAS)	Depart Marsh Crk Cr (MCC)	Arrive Rail Station (CON)	Arrive DVC	Depart DVC	Depart Rail Station (CON)	Arrive Wash/ Clay (WAS)	Arrive Marsh Crk Cr (MCC)
4						5:21A		5:42
4		4:43		6:36	6:38			7:23
4		7:24		8:18	8:25		9:09	
4	9:11			9:59	10:05		10:50	
4	10:52A			11:37A	11:45A			12:29P
4		12:29		1:17	1:25		2:09	
4	2:09			2:58	3:00		3:54	
4	4:54			4:43	4:55		5:52	
4	5:55			6:44	6:50		7:38	
4	7:42			8:26	8:40		9:24	
4	9:24			10:06	10:10		10:53	
4	10:53P		11:18P					
5						5:36A	6:02A	
5	6:02			6:51	6:53		7:39	
5	7:39			8:34	8:45			9:29
5		9:29		10:19	10:25		11:09	
5	11:10A			11:57A	12:05P		12:49	
5	12:52			1:37	1:45			2:29
5		2:32		3:22	3:40			4:35
5		4:36		5:23	5:25		6:22	
5	6:25P			7:14P				
6						5:45A	6:11A	
6	6:11			7:01	7:08		7:55	
6	7:55A		8:24A					
7					5:30A			6:17A
7		6:18		7:13	7:14			7:55
7		8:00		8:54	9:05		9:50	
7	9:53			10:39	10:45			11:29
7		11:29A		12:17P	12:25P		1:09P	
7	1:10			1:57	2:01		2:54	

The blocking of Route 110 continues.

BLOCKING SHEET

Route #: 110
 Date: xx/xx/xx
 Scheduler: BN

Special Instructions: 5 - 10 min recovery/
 layover. Consider internal layover at rail
 station as part of amount required at
 terminal.

Block No.	Westbound				Eastbound			
	Depart Wash/ Clay (WAS)	Depart Marsh Crk Cr (MCC)	Arrive Rail Station (CON)	Arrive DVC	Depart DVC	Depart Rail Station (CON)	Arrive Wash/ Clay (WAS)	Arrive Marsh Crk Cr (MCC)
7	2:54			3:43	3:55		4:50	
7	4:50			5:44	5:45			6:44
7		6:45P		7:31P				
8					5:44A		6:32A	
8	6:32			7:23	7:24		8:09	
8	8:09A		8:38A					
9					6:00A			6:47A
9		6:48		7:43	7:44		8:29	
9	8:29A		8:56A					
10					3:20P		4:13P	
10	4:13			5:04	5:15			6:14
10		6:15		7:04	7:10			7:57
10		8:00P	8:24P					
11						4:12P	4:44P	
11	4:45			5:34	5:35		6:30	
11	6:33			7:24	7:30		8:14	
11	8:14			8:56	9:10		9:53	
11	9:53P		10:18P					
12						4:50P	5:22P	
12	5:25			6:14	6:20			7:17
12		7:23		8:06	8:10			8:57
12		9:00P	9:24P					
13						5:10P		5:44
13		5:45P		6:34P				
14						5:30P	6:00P	
14		6:03P		6:54P				

The blocking of Route 110 continues.

BLOCKING SHEET								
Route #: 110					Special Instructions: 5 - 10 min recovery/ layover. Consider internal layover at rail station as part of amount required at terminal.			
Date: xx/xx/xx								
Scheduler: BN								
Block No.	Westbound				Eastbound			
	Depart Wash/ Clay (WAS)	Depart Marsh Crk Cr (MCC)	Arrive Rail Station (CON)	Arrive DVC	Depart DVC	Depart Rail Station (CON)	Arrive Wash/ Clay (WAS)	Arrive Marsh Crk Cr (MCC)
15			5:35P	5:54P	5:55P		6:52P	
15	6:55			7:41	7:50		8:33	
15	8:37			9:26	9:40		10:24	
15	10:24P		10:48P					
16(S)	2:44P		2:51 CKP					

The blocking sheet contains the final blocks.

D. Observations about the completed blocks

- Block 3 is the first of the peak only blocks. It runs only during the morning peak, from 5:05 a.m. to 9:25 a.m. This block pulls in and out at the rail station, providing bus to rail feeder service for morning commuters. Blocks 6, 8, and 9 also operate only during the morning peak.
- Block 16(S) is a special block that operates only on school days. It is the only block that pulls off the line at Concord @ Kirker Pass (CKP) and the only block that does not serve the rail station (CON).
- Blocks 13 and 14 operate only during the P.M. peak. Blocks 10, 11, 12 and 15 pull out in the P.M. peak, but continue into the evening period as well.

E. Noting block numbers on the master schedule

Double checking that all trips have been blocked is commonly done by noting the block number next to the trip number on the master schedule. Directional Route 110 master schedules with block notations are shown on the following pages.

Block	Trip #	Via	Lv MCC	Lv WAS	MYV	CKP	CLA	CLT	Arr CON	Lv CON	FRY	Arr DVC
1	1W	K		5:04		5:13	5:17	5:22	5:30	5:33	5:38	5:49
2	2W	P		5:21	5:28		5:32	5:37	5:45	5:48	5:53	6:04
3	3W	K		5:31		5:40	5:45	5:51	6:00	6:03	6:09	6:21
4	4W	M	5:43	5:57			6:00	6:06	6:15	6:18	6:24	6:36
5	5W	P		6:02	6:10		6:15	6:21	6:30	6:33	6:39	6:51
6	6W	K		6:11		6:20	6:25	6:31	6:40	6:43	6:49	7:01
7	7W	M	6:18	6:32			6:35	6:41	6:50	6:55	7:01	7:13
8	8W	P		6:32	6:40		6:45	6:51	7:00	7:05	7:11	7:23
9	9W	K		6:41		6:50	6:55	7:01	7:10	7:15	7:21	7:33
10	10W	M	6:48	7:02			7:05	7:11	7:20	7:25	7:31	7:43
11	11W	P		7:02	7:10		7:15	7:21	7:30	7:35	7:41	7:53
12	12W	K		7:11		7:20	7:25	7:31	7:40	7:45	7:51	8:03
13	13W	M	7:24	7:38			7:41	7:46	7:55	8:00	8:06	8:18
14	14W	P		7:39	7:47		7:52	7:58	8:07	8:15	8:21	8:34
15	15W	K		7:55		8:04	8:09	8:15	8:24	Out of service		
16	16W	M	8:00	8:14			8:17	8:23	8:32	8:35	8:41	8:54
17	17W	P		8:09	8:17		8:23	8:29	8:38	Out of service		
18	18W	P		8:14	8:21		8:27	8:33	8:42	8:55	9:01	9:14
19	19W	K		8:29		8:38	8:42	8:47	8:56	Out of service		
20	20W	M	8:40	8:54			8:57	9:02	9:11	9:13	9:19	9:32
21	21W	P		9:00	9:07		9:11	9:16	9:25	Out of service		
22	22W	K		9:11		9:20	9:24	9:29	9:38	9:40	9:46	9:59
23	23W	M	9:29	9:41			9:44	9:49	9:58	10:00	10:06	10:19
24	24W	P		9:53	10:00		10:04	10:09	10:18	10:20	10:26	10:39
25	25W	K		10:11		10:20	10:24	10:29	10:38	10:40	10:46	10:59
26	26W	M	10:29	10:41			10:44	10:49	10:58	11:00	11:06	11:19
27	27W	P		10:52	10:59		11:03	11:09	11:18	11:20	11:25	11:37
28	28W	K		11:10		11:19	11:23	11:29	11:38	11:40	11:45	11:57
29	29W	M	11:29	11:40			11:43	11:49	11:58	12:00	12:05	12:17
30	30W	P		11:52	11:59		12:03	12:09	12:18	12:20	12:25	12:37
31	31W	K		12:10		12:19	12:23	12:29	12:38	12:40	12:45	12:57
32	32W	M	12:29	12:40			12:43	12:49	12:58	1:00	1:05	1:17
33	33W	P		12:52	12:59		1:03	1:09	1:18	1:20	1:25	1:37
34	34W	K		1:10		1:19	1:23	1:29	1:38	1:40	1:45	1:57
35	35W	M	1:29	1:40			1:43	1:49	1:58	2:00	2:05	2:18
36	36W	P		1:52	1:59		2:03	2:09	2:18	2:20	2:25	2:38
37	37W	K		2:09		2:18	2:23	2:29	2:39	2:40	2:45	2:58
38	38W	M	2:32	2:40			2:43	2:49	2:59	3:04	3:09	3:22
39	39W	K		2:44S		2:51S						
40	40W	P		2:54	3:03		3:07	3:13	3:23	3:25	3:30	3:43
41	41W	K		3:12		3:21	3:26	3:32	3:42	3:47	3:52	4:05
42	42W	M	3:36	3:44			3:47	3:53	4:03	4:05	4:10	4:23
43	43W	P		3:54	4:03		4:07	4:13	4:23	4:25	4:30	4:43
44	44W	K		4:13		4:22	4:27	4:33	4:43	4:46	4:51	5:04
45	45W	M	4:36	4:44			4:47	4:53	5:03	5:05	5:10	5:23
46	46W	P		4:45	4:53		4:57	5:03	5:13	5:15	5:21	5:34
47	47W	K		4:50		4:59	5:04	5:10	5:20	5:25	5:31	5:44
48	48W	--								5:35	5:41	5:54
49	49W	M	5:15	5:23			5:27	5:33	5:43	5:45	5:51	6:04
50	50W	P		5:25	5:33		5:37	5:43	5:53	5:55	6:01	6:14
51	51W	K		5:33		5:42	5:47	5:53	6:03	6:05	6:11	6:24
52	52W	M	5:45	5:53			5:57	6:03	6:13	6:15	6:21	6:34
53	53W	P		5:55	6:03		6:07	6:13	6:23	6:25	6:31	6:44
54	54W	K		6:03		6:12	6:17	6:23	6:33	6:35	6:41	6:54
55	55W	M	6:15	6:23			6:27	6:33	6:43	6:45	6:51	7:04
56	56W	P		6:25	6:33		6:37	6:43	6:53	6:55	7:01	7:14
57	57W	K		6:33		6:42	6:47	6:53	7:03	7:05	7:11	7:24
58	58W	M	6:45	6:53			6:57	7:03	7:11	7:15	7:20	7:31
59	59W	P		6:55	7:03		7:07	7:13	7:21	7:25	7:30	7:41
60	60W	K		7:07		7:15	7:19	7:24	7:32	Out of service		
61	61W	M	7:23	7:31			7:34	7:39	7:47	7:50	7:55	8:06
62	62W	P		7:28	7:35		7:39	7:44	7:52	Out of service		
63	63W	K		7:42		7:50	7:54	7:59	8:07	8:10	8:15	8:26
64	64W	M	8:00	8:08			8:11	8:16	8:24	Out of service		
65	65W	P		8:14	8:21		8:25	8:30	8:38	8:40	8:45	8:56
66	66W	K		8:37		8:45	8:49	8:53	9:01	9:10	9:15	9:26
67	67W	M	9:00	9:08			9:11	9:16	9:24			
68	68W	P		9:24	9:31		9:35	9:40	9:48	9:50	9:55	10:06
69	69W	K		9:53		10:01	10:05	10:10	10:18	Out of service		
70	70W	P		10:24	10:31		10:35	10:40	10:48	Out of service		
71	71W	K		10:53		11:01	11:05	11:10	11:18	Out of service		

Route 110 /WESTbound with block notations

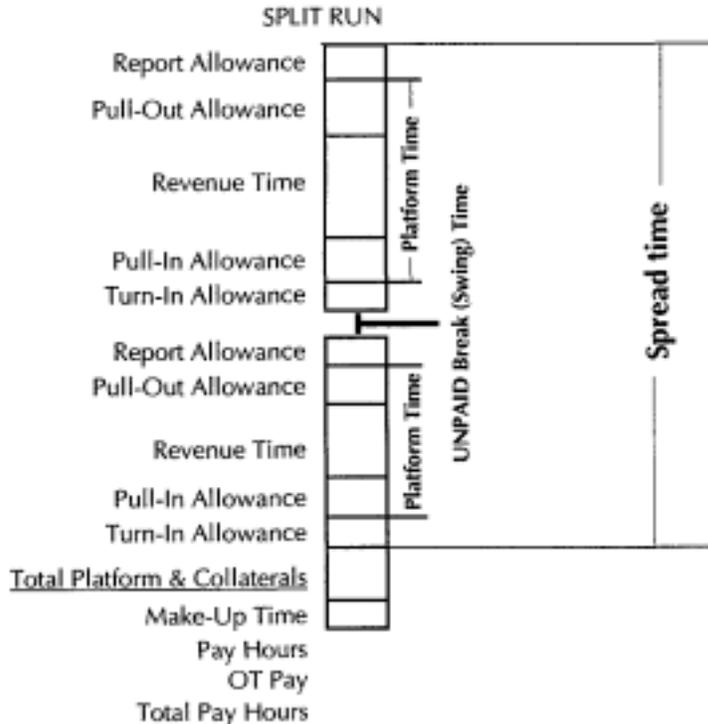
Advanced Chapter 3/ Blocking

Block #	Trip #	Via	Lv DVC	CLD	Arr CON	Lv CON	CLT	CLA	CKP	MYV	Arr WAS	Arr MCC
1	1E	P				4:43	4:49	4:53		4:57	5:04	
2	2E	K				4:59	5:05	5:09	5:13		5:21	
3	3E	P				5:05	5:11	5:15		5:19	5:27	
4	4E	M				5:21	5:27	5:31			5:34	5:42
5	5E	K				5:36	5:44	5:49	5:53		6:02	
6	6E	P				5:45	5:53	5:58		6:03	6:11	
7	7E	M	5:30	5:40	5:46	5:52	6:00	6:05			6:09	6:17
8	8E	K	5:44	5:55	6:02	6:06	6:14	6:19	6:23		6:32	
9	9E	P	5:54	6:05	6:12	6:15	6:23	6:28		6:33	6:41	
10	10E	M	6:00	6:11	6:18	6:22	6:30	6:35			6:39	6:47
11	11E	K	6:14	6:25	6:32	6:36	6:44	6:49	6:53		7:02	
12	12E	P	6:23	6:34	6:41	6:45	6:53	6:58		7:03	7:11	
13	13E	M	6:38	6:49	6:56	6:58	7:06	7:11			7:15	7:23
14	14E	K	6:53	7:04	7:11	7:13	7:21	7:26	7:30		7:39	
15	15E	P	7:08	7:19	7:26	7:29	7:37	7:42		7:47	7:55	
16	16E	M	7:14	7:25	7:32	7:34	7:42	7:47			7:47	7:55
17	17E	K	7:24	7:35	7:42	7:43	7:51	7:56	8:00		8:09	
18	18E	K	7:34	7:45	7:52	7:53	8:00	8:04	8:07		8:14	
19	19E	P	7:44	7:55	8:02	8:04	8:12	8:17		8:22	8:29	
20	20E	M	7:55	8:06	8:13	8:15	8:23	8:28			8:32	8:40
21	21E	K	8:10	8:21	8:28	8:30	8:38	8:43	8:47		8:55	
22	22E	P	8:25	8:36	8:43	8:45	8:53	8:58		9:02	9:09	
23	23E	M	8:45	8:56	9:03	9:05	9:13	9:18			9:21	9:29
24	24E	K	9:05	9:16	9:23	9:25	9:33	9:38	9:42		9:50	
25	25E	P	9:25	9:36	9:43	9:45	9:53	9:58		10:02	10:09	
26	26E	M	9:45	9:56	10:03	10:05	10:13	10:18			10:21	10:29
27	27E	K	10:05	10:16	10:22	10:25	10:38	10:42	10:42		10:50	
28	28E	P	10:25	10:36	10:42	10:45	10:53	10:58		11:02	11:09	
29	29E	M	10:45	10:56	11:02	11:05	11:13	11:18			11:21	11:29
30	30E	K	11:05	11:16	11:22	11:25	11:33	11:38	11:42		11:50	
31	31E	P	11:25	11:36	11:42	11:45	11:53	11:58		12:02	12:09	
32	32E	M	11:45	11:56	12:02	12:05	12:13	12:18			12:21	12:29
33	33E	K	12:05	12:16	12:22	12:25	12:33	12:38	12:42		12:49	
34	34E	P	12:25	12:36	12:42	12:45	12:53	12:58		1:02	1:09	
35	35E	M	12:45	12:56	1:02	1:05	1:13	1:18			1:21	1:29
36	36E	K	1:05	1:16	1:22	1:25	1:33	1:38	1:42		1:49	
37	37E	P	1:25	1:36	1:42	1:45	1:53	1:58		2:02	2:09	
38	38E	M	1:45	1:56	2:02	2:05	2:13	2:18			2:21	2:29
39	39E	K	2:01	2:14	2:21	2:24	2:33	2:39	2:44		2:54	
40	40E	P	2:20	2:33	2:40	2:43	2:52	2:58		3:03	3:12	
41	41E	M	2:40	2:53	3:00	3:03	3:12	3:18			3:22	3:36
42	42E	K	3:00	3:13	3:20	3:24	3:33	3:39	3:44		3:54	
43	43E	P	3:20	3:33	3:40	3:44	3:53	3:59		4:04	4:13	
44	44E	M	3:40	3:53	4:00	4:02	4:11	4:17			4:21	4:35
45	45E	K				4:12	4:22	4:29	4:34		4:44	
46	46E	P	3:55	4:08	4:16	4:20	4:30	4:37		4:42	4:50	
47	47E	M	4:15	4:28	4:36	4:40	4:50	4:57			5:00	5:14
48	48E	K				4:50	5:00	5:07	5:12		5:22	
49	49E	P	4:35	4:48	4:56	5:00	5:10	5:17		5:22	5:30	
50	50E	M				5:10	5:20	5:27			5:30	5:44
51	51E	K	4:55	5:08	5:16	5:20	5:30	5:37	5:42		5:52	
52	52E	P				5:30	5:40	5:47		5:52	6:00	
53	53E	M	5:15	5:28	5:36	5:40	5:50	5:57			6:00	6:14
54	54E	K	5:25	5:38	5:46	5:50	6:00	6:07	6:12		6:22	
55	55E	P	5:35	5:48	5:56	6:00	6:10	6:17		6:22	6:30	
56	56E	M	5:45	5:58	6:00	6:10	6:20	6:27			6:30	6:44
57	57E	K	5:55	6:08	6:16	6:20	6:30	6:37	6:42		6:52	
58	58E	P	6:05	6:18	6:26	6:30	6:40	6:47		6:52	7:00	
59	59E	M	6:20	6:33	6:41	6:45	6:55	7:02			7:05	7:17
60	60E	P	6:35	6:48	6:56	7:00	7:07	7:12	7:16		7:24	
61	61E	K	6:50	7:03	7:11	7:15	7:22	7:27		7:31	7:38	
62	62E	M	7:10	7:21	7:27	7:30	7:37	7:42			7:45	7:57
63	63E	K	7:30	7:41	7:47	7:50	7:57	8:02	8:06		8:14	
64	64E	P	7:50	8:01	8:07	8:10	8:17	8:22		8:26	8:33	
65	65E	M	8:10	8:21	8:27	8:30	8:37	8:42			8:45	8:57
66	66E	K	8:40	8:51	8:57	9:00	9:07	9:12	9:16		9:24	
67	67E	P	9:10	9:21	9:27	9:30	9:37	9:42		9:46	9:53	
68	68E	K	9:40	9:51	9:57	10:00	10:07	10:12	10:16		10:24	
69	69E	P	10:10	10:21	10:27	10:30	10:37	10:42		10:46	10:53	

Route 110 /EASTbound with block notations

IV. Evaluating the Blocks

Efficient runcutting (see chapter 4) depends on how "well" the blocks can be "cut" into runs. Of prime consideration is how well the blocks cut so that any split runs will conform to spread restrictions.



Restrictions generally apply based on the length of spread time for two or more block pieces that are tied together into one operator assignment (run). When split runs exceed the maximum spread limit, they may be considered "illegal" runs. Spread limits may also be imposed at lesser spread times and result in spread penalties (additional pay).

Therefore, evaluating the blocks for efficient runcutting is an important step in the scheduling process. To facilitate this process, block graphs can be extremely useful.

Exceeding spread time limits may result in illegal runs or spread penalties

A. Block graphs

A graph of the initial Route 110 blocks follows. This block graph displays revenue service hours for each block rather than platform time (which includes pull-out and pull-in times). Revenue hours display is desirable at this stage in order to assess the start and end times of potential candidate pairings. If platform times were displayed, garage deadhead times would have to be deducted first before candidate pairings could be evaluated.

A number of observations can be made about this block graph:

- The length of four of the P.M. peak blocks (Blocks 10, 11, 12 and 15) is not conducive to efficient runcutting. They are not long enough to be stand-alone straight runs without granting excessive make-up time. Consequently they are likely candidates to be considered for split runs. However, all four operate too late into the evening to be coupled with existing A.M. pieces without creating illegal runs or paying excessive spread penalties.
- Block 16S is a very small piece of work. It is not practical for it to remain a separate block.
- The current base blocks appear to lend themselves to various cutting options given that on-street reliefs can be made at the rail station (arrival time only) and at DVC (arrival time only).

Block No.	START/END OF REVENUE TIME																Revenue Hours										
	4a	5a	6a	7a	8a	9a	10a	11a	12p	1p	2p	3p	4p	5p	6p	7p		8p	9p	10p	11p						
	Early AM		AM Peak			Base (Midday)					School		PM Peak		Evening			Night									
1	443a		-----																732p	14:49							
2	459a		-----																752p	14:53							
3	505a		-----			925a																					4:20
4	521a		-----																1118p	17:57							
5	536a		-----																714p	13:38							
6	545a		-----			824a																					2:39
7	530a		-----																731p	14:01							
8	544a		-----			838a																					2:54
9	600a		-----			856a																					2:56
10																	320p	-----			824p	5:04					
11																	412p	-----			1018p	6:06					
12																	450p	-----			924p	4:34					
13																	510p	-----		634p	1:24						
14																	530p	-----		654p	1:24						
15																	535p	-----			1048p	5:13					
16S																	244p	-----		251p	:07						
Block No.	START/END OF REVENUE TIME																111:59										

Initial Route 110 blocks

With the observations on the previous page in mind, the next step is to evaluate ways to re-block some of the trips so that the resultant runs conform to spread restrictions and effectively utilize available resources.

B. Re-blocking Block 10 (Block 4)

Block 10 starts revenue service too early (3:20 p.m.) to be preceded by another current P.M. block and Block 10 ends too late (8:24 p.m.) to fall into an acceptable spread range if it were combined with a current A.M. piece to form a split run.

The scheduler has decided to check the master schedule to see what other trips are hooked just prior to Block 10's DVC 3:20 p.m. departure time. It is discovered that Block 4, trip 42E departs DVC at 3:00 p.m.

Trip #	Via	Lv DVC	CLD	Arr CON	Lv CON	CLT	CLA	CKP	MYV	Arr WAS	Arr MCC
4 - 42E	K	3:00	3:13	3:20	3:24	3:33	3:39	3:44		3:54	
10 - 43E	P	3:20	3:33	3:40	3:44	3:53	3:59		4:04	4:13	

Block 10 now starts here

What if Block 4 ended its current set of trip hooks at 3:00 p.m. and took on the current Block 10 trips at 3:20 p.m. – and Block 10 took over the original Block 4 trips beginning at 3:00 p.m.?

- 1) A Block 4 20-minute layover would occur at DVC (3:00 p.m. to 3:20 p.m.).
- 2) New Block 4 trips would still begin at 5:21 a.m. but now end at 8:24 p.m. (15:03 total revenue service).
- 3) Block 10 trips would begin at 3:00 p.m. and end at 11:18 p.m. (8:18 total revenue service).
- 4) Total revenue hours would be 112:19 (an increase of 20 minutes).
- 5) Revised Block 4 would still be a base block and of sufficient length to cut into two runs.
- 6) Revised Block 10 would be a P.M. straight run.
- 7) The spread problem associated with the original Block 10 would be eliminated.

The adjustment appears appropriate and is reflected in the revised block graph shown on the next page. The "cost" of this adjustment is an increase of :20 in layover. However, the elimination of the spread problem justifies this move. The use of colored pencils is a good way to track incremental actions when noting blocking adjustments on the master schedule.

C. Re-blocking Block 11 (Block 5)

Blocks 11, 12 and 15 demonstrate similar characteristics as the original Block 10. However, because they start "later," there might be a possibility of hooking blocks that finish earlier onto the front. The only apparent possibility would be 16S, but the excessive layover at the rail station would tend to prohibit this move.

The scheduler could consider hooking the later trips associated with Blocks 11, 12 and 15 into base Blocks 1, 2, 5 or 7. This would make Blocks 11, 12 and 15 shorter in length and could turn them into trippers or second pieces of split runs. The base blocks, with the addition of the later trips, could still be of sufficient length to cut into two straight runs.

Block 5, trip 56W finishes at DVC at 7:14 p.m. and immediately precedes Block 11, trip 57W which arrives at DVC at 7:24 p.m. Block 11 then hooks to the 7:30 p.m. departure trip 63E. Re-hooking the 7:30 p.m. departure from Block 11 to Block 5, along with subsequent Block 11 trips, results in an end revenue time of 7:24 p.m. for the revised Block 11.

Trip #	Via	Lv MCC	Lv WAS	MYV	CKP	CLA	CLT	Arr CON	Lv CON	FRY	Arr DVC	Arr MCC
5 - 56W	P		6:25	6:33		6:37	6:43	6:53	6:55	7:01	7:14	
11 - 57W	K		6:33		6:42	6:47	6:53	7:03	7:05	7:11	7:24	

Block 5 ends here

Trip #	Via	Lv DVC	CLD	Arr CON	Lv CON	CLT	CLA	CKP	MYV	Arr WAS	Arr MCC
11 - 63E	K	7:30	7:41	7:47	7:50	7:57	8:02	8:06		8:14	

What if Block 5 took on the current Block 11 trips starting with trip 63E from DVC at 7:30 p.m.?

- 1) Layover at DVC would be 16 minutes (7:14 p.m. to 7:30 p.m.).
- 2) Total revenue hours would increase to 112:29 (a 10 minute increase).
- 3) Revised Block 11 would become a P.M. piece (4:12 p.m. to 7:24 p.m.), better suited as the P.M. part of a split run.
- 4) Revised Block 5 would still be a base block of sufficient length (5:36 a.m. to 10:18 p.m.) to cut into two straight runs (16:42).

D. Block graphs revised for Blocks 4 & 10 and 5 & 11

Block No.	START/END OF REVENUE TIME																Revenue Hours																					
	4a	5a	6a	7a	8a	9a	10a	11a	12p	1p	2p	3p	4p	5p	6p	7p		8p	9p	10p	11p																	
	Early AM		AM Peak			Base (Midday)						School		PM Peak			Evening		Night																			
1	443a		-----																732p	14:49																		
2	459a		-----																752p	14:53																		
3	505a		-----			925a																						4:20										
4 old	521a		-----																1118p	17:57																		
4 Revised	521a		-----																824p	15:03																		
5 old	536a		-----																714p	13:38																		
5 Revised	536a		-----																1018p	16:42																		
6	545a		-----			824a																						2:39										
7	530a		-----																731p	14:01																		
8	544a		-----			838a																						2:54										
9	600a		-----			856a																						2:56										
10 old																	320p	-----		824p	-----		1118p	5:04														
10 Revised																	300p	-----																1118p	8:18			
11 old																	412p	-----		1018p	-----		1118p	6:06														
11 Revised																	412p	-----			724p																	3:12
12																	450p	-----			924p																	4:34
13																	510p	-----		634p																	1:24	
14																	530p	-----		654p																	1:24	
15																	535p	-----						1048p	-----		1118p	5:13										
16S																	244p	-----		251p																	:07	
Block No.	START/END OF REVENUE TIME																112:19																					

Block graph for Route 110 - revisions to Blocks 4, 5, 10 and 11

E. Re-blocking Block 15 (Block 7)

A similar situation exists for Block 15. It is not long enough (5:13) to cut into a straight run and it ends too late (10:48 p.m.) to be the second piece of a split run (excessive spread time). Again, the scheduler looks at the possibility of re-hooks.

Block 15, trip 59W arrives at DVC at 7:41 p.m., then continues as trip 64E, departing DVC at 7:50 p.m. Block 7, trip 58W, is currently finished for the day at DVC at 7:31 p.m. By rehooking 64E (and subsequent Block 15 trips) onto Block 7, Block 15 would then finish for the day at DVC at 7:41 p.m.

Trip #	Via	Lv MCC	Lv WAS	MYV	CKP	CLA	CLT	Arr CON	Lv CON	FRY	Arr DVC
7 - 58W	M	6:45	6:53			6:57	7:03	7:11	7:15	7:20	7:31
15 - 59W	P		6:55	7:03		7:07	7:13	7:21	7:25	7:30	7:41

Trip #	Via	Lv DVC	CLD	Arr CON	Lv CON	CLT	CLA	CKP	MYV	Arr WAS	Arr MCC
15 - 64E	P	7:50	8:01	8:07	8:10	8:17	8:22		8:26	8:33	

Block 7 now finishes here (pointing to 7:31 in the first table)

Current Block 15 hook (line connecting 7:50 in the second table to 7:41 in the first table)

What would be the consequences of rehooking 64E and subsequent Block 15 trips onto Block 7 and ending Block 15 at 7:41 p.m.?

- 1) A 19-minute layover for Block 7 at DVC (7:31 p.m. to 7:50 p.m.).
- 2) Total revenue hours would increase to 112:39 (a 10 minute increase).
- 3) Revised Block 15 would be a P.M. tripper piece of 2:09 (5:35 p.m. to 7:41 p.m.).
- 4) Revised Block 7 would still be a base block of sufficient length, 17:18 (5:30 a.m. to 10:48 p.m.) to cut into two straight runs.

F. Re-blocking Block 12 (Block 1)

As with Block 15 above, Block 12 is not long enough to cut into a straight run (4:34) and it ends too late 9:24 p.m.) to be the second piece of a split run (excessive spread time). The master schedule provides the following possibility.

Block 12, trip 61W, arrives at the rail station (CON) at 7:47 p.m. and is scheduled to depart CON at 7:50 p.m. Block 1, trip 60W, arrives at CON at 7:32 p.m. (15 minutes prior to Block 12) and is scheduled to go out of service at that time and location. By rehooking Block 12's scheduled 7:50 p.m. departure from CON to Block 1, Block 12 could be finished at 7:47 p.m.

Trip #	Via	Lv MCC	Lv WAS	MYV	CKP	CLA	CLT	Arr CON	Lv CON	FRY	Arr DVC
1 - 60W	K		7:07		7:15	7:19	7:24	7:32		Out of service	
12 - 61W	M	7:23	7:31			7:34	7:39	7:47	7:50	7:55	8:06

Out of service (pointing to 7:32 in the table)

What would be the results of ending Block 12 at CON at 7:47 p.m. and having Block 1 make subsequent Block 12 trips?

- 1) Block 1 layover at CON would be 18 minutes (7:32 p.m. to 7:50 p.m.).
- 2) Total revenue hours would be 112:54.
- 3) Revised Block 12 would be a P.M. tripper piece of 2:57 (4:50 p.m. to 7:47 p.m.).
- 4) Revised Block 1, now ending at 9:24 p.m., is still a base block of sufficient length (16:41) to cut into two straight runs.

The revisions to Blocks 15, 7, 12 and 1 are shown on the block graph on the following page.

G. Block graphs revised for Blocks 7 & 15 and 1 & 12

Block No.	START/END OF REVENUE TIME											Revenue Hours										
	4a	5a	6a	7a	8a	9a	10a	11a	12p	1p	2p		3p	4p	5p	6p	7p	8p	9p	10p	11p	
	Early AM		AM Peak			Base (Midday)					School		PM Peak		Evening			Night				
1 Old																					14:49	
1 Revised	443a																732p				16:41	
2		459a															752p				14:53	
3																					4:20	
4 Revised		521a																	824p		15:03	
5 Revised			536a																	1018p	16:42	
6			545a		824a																2:39	
7 old																					14:01	
7 Revised			530a														731p				17:18	
8			544a		838a																2:54	
9			600a		856a																2:56	
10 Revised														300p							8:18	
11 Revised														412p		724p					3:12	
12 Old														450p					924p		4:34	
12 Revised														450p		747p					2:57	
13														510p		634p					1:24	
14														530p		654p					1:24	
15 old														535p						1048p	5:13	
15 Revised														535p		741p					2:06	
16S														244p		251p					:07	
Block No.	START/END OF REVENUE TIME																					112:54
	4a	5a	6a	7a	8a	9a	10a	11a	12p	1p	2p	3p	4p	5p	6p	7p	8p	9p	10p	11p		

Block graph for Route 110 - revisions to Blocks 1, 7, 12 and 15

Block 16S, although undesirable, remains unchanged. The scheduler has determined that further analysis will take place in the runcutting process where other route pieces will be available.

H. Final Route 110 block graph

Block No.	START/END OF REVENUE TIME														Revenue Hours																			
	4a	5a	6a	7a	8a	9a	10a	11a	12p	1p	2p	3p	4p	5p		6p	7p	8p	9p	10p	11p													
	Early AM		AM Peak			Base (Midday)					School		PM Peak			Evening			Night															
1	443a		-----														924p	16:41																
2	459a		-----														752p	14:53																
3	505a		-----			925a																			4:20									
4	521a		-----														824p	15:03																
5	536a		-----														1018p	16:42																
6	545a		-----			824a																			2:39									
7	530a		-----														1048p	17:18																
8	544a		-----			838a																			2:54									
9	600a		-----			856a																			2:56									
10												300p		-----														1118p	8:18					
11												412p		-----			724p																	3:12
12												450p		-----			747p																	2:57
13												510p		-----		634p																1:24		
14												530p		-----		654p																1:24		
15												535p		-----		741p																2:06		
16S												244p		-----		251p																:07		
Block No.	START/END OF REVENUE TIME														112:54																			
	4a	5a	6a	7a	8a	9a	10a	11a	12p	1p	2p	3p	4p	5p	6p	7p	8p	9p	10p	11p														

Final block graph for Route 110

I. Revised Master Schedule (with notations for new blocks)

Block #	Trip #	Via	Lv MCC	Lv WAS	MYV	CKP	CLA	CLT	Arr CON	Lv CON	FRY	Arr DVC
1	1W	K		5:04		5:13	5:17	5:22	5:30	5:33	5:38	5:49
2	2W	P		5:21	5:28		5:32	5:37	5:45	5:48	5:53	6:04
3	3W	K		5:31		5:40	5:45	5:51	6:00	6:03	6:09	6:21
4	4W	M	5:43	5:57			6:00	6:06	6:15	6:18	6:24	6:36
5	5W	P		6:02	6:10		6:15	6:21	6:30	6:33	6:39	6:51
6	6W	K		6:11		6:20	6:25	6:31	6:40	6:43	6:49	7:01
7	7W	M	6:18	6:32			6:35	6:41	6:50	6:55	7:01	7:13
8	8W	P		6:32	6:40		6:45	6:51	7:00	7:05	7:11	7:23
9	9W	K		6:41		6:50	6:55	7:01	7:10	7:15	7:21	7:33
10	10W	M	6:48	7:02			7:05	7:11	7:20	7:25	7:31	7:43
11	11W	P		7:02	7:10		7:15	7:21	7:30	7:35	7:41	7:53
12	12W	K		7:11		7:20	7:25	7:31	7:40	7:45	7:51	8:03
13	13W	M	7:24	7:38			7:41	7:46	7:55	8:00	8:06	8:18
14	14W	P		7:39	7:47		7:52	7:58	8:07	8:15	8:21	8:34
15	15W	K		7:55		8:04	8:09	8:15	8:24	Out of service		
16	16W	M	8:00	8:14			8:17	8:23	8:32	8:35	8:41	8:54
17	17W	P		8:09	8:17		8:23	8:29	8:38	Out of service		
18	18W	P		8:14	8:21		8:27	8:33	8:42	8:55	9:01	9:14
19	19W	K		8:29		8:38	8:42	8:47	8:56	Out of service		
20	20W	M	8:40	8:54			8:57	9:02	9:11	9:13	9:19	9:32
21	21W	P		9:00	9:07		9:11	9:16	9:25	Out of service		
22	22W	K		9:11		9:20	9:24	9:29	9:38	9:40	9:46	9:59
23	23W	M	9:29	9:41			9:44	9:49	9:58	10:00	10:06	10:19
24	24W	P		9:53	10:00		10:04	10:09	10:18	10:20	10:26	10:39
25	25W	K		10:11		10:20	10:24	10:29	10:38	10:40	10:46	10:59
26	26W	M	10:29	10:41			10:44	10:49	10:58	11:00	11:06	11:19
27	27W	P		10:52	10:59		11:03	11:09	11:18	11:20	11:25	11:37
28	28W	K		11:10		11:19	11:23	11:29	11:38	11:40	11:45	11:57
29	29W	M	11:29	11:40			11:43	11:49	11:58	12:00	12:05	12:17
30	30W	P		11:52	11:59		12:03	12:09	12:18	12:20	12:25	12:37
31	31W	K		12:10		12:19	12:23	12:29	12:38	12:40	12:45	12:57
32	32W	M	12:29	12:40			12:43	12:49	12:58	1:00	1:05	1:17
33	33W	P		12:52	12:59		1:03	1:09	1:18	1:20	1:25	1:37
34	34W	K		1:10		1:19	1:23	1:29	1:38	1:40	1:45	1:57
35	35W	M	1:29	1:40			1:43	1:49	1:58	2:00	2:05	2:18
36	36W	P		1:52	1:59		2:03	2:09	2:18	2:20	2:25	2:38
37	37W	K		2:09		2:18	2:23	2:29	2:39	2:40	2:45	2:58
38	38W	M	2:32	2:40			2:43	2:49	2:59	3:04	3:09	3:22
16(S)	39W	K		2:44S		2:51S						
40	40W	P		2:54	3:03		3:07	3:13	3:23	3:25	3:30	3:43
41	41W	K		3:12		3:21	3:26	3:32	3:42	3:47	3:52	4:05
42	42W	M	3:36	3:44			3:47	3:53	4:03	4:05	4:10	4:23
43	43W	P		3:54	4:03		4:07	4:13	4:23	4:25	4:30	4:43
44	44W	K		4:13		4:22	4:27	4:33	4:43	4:46	4:51	5:04
45	45W	M	4:36	4:44			4:47	4:53	5:03	5:05	5:10	5:23
46	46W	P		4:45	4:53		4:57	5:03	5:13	5:15	5:21	5:34
47	47W	K		4:50		4:59	5:04	5:10	5:20	5:25	5:31	5:44
48	48W	--								5:35	5:41	5:54
49	49W	M	5:15	5:23			5:27	5:33	5:43	5:45	5:51	6:04
50	50W	P		5:25	5:33		5:37	5:43	5:53	5:55	6:01	6:14
51	51W	K		5:33		5:42	5:47	5:53	6:03	6:05	6:11	6:24
52	52W	M	5:45	5:53			5:57	6:03	6:13	6:15	6:21	6:34
53	53W	P		5:55	6:03		6:07	6:13	6:23	6:25	6:31	6:44
54	54W	K		6:03		6:12	6:17	6:23	6:33	6:35	6:41	6:54
55	55W	M	6:15	6:23			6:27	6:33	6:43	6:45	6:51	7:04
56	56W	P		6:25	6:33		6:37	6:43	6:53	6:55	7:01	7:14
57	57W	K		6:33		6:42	6:47	6:53	7:03	7:05	7:11	7:24
58	58W	M	6:45	6:53			6:57	7:03	7:11	7:15	7:20	7:31
59	59W	P		6:55	7:03		7:07	7:13	7:21	7:25	7:30	7:41
60	60W	K		7:07		7:15	7:19	7:24	7:32	Out of service		
61	61W	M	7:23	7:31			7:34	7:39	7:47	7:50	7:55	8:06
62	62W	P		7:28	7:35		7:39	7:44	7:52	Out of service		
63	63W	K		7:42		7:50	7:54	7:59	8:07	8:10	8:15	8:26
64	64W	M	8:00	8:08			8:11	8:16	8:24	Out of service		
65	65W	P		8:14	8:21		8:25	8:30	8:38	8:40	8:45	8:56
66	66W	K		8:37		8:45	8:49	8:53	9:01	9:10	9:15	9:26
67	67W	M	9:00	9:08			9:11	9:16	9:24			
68	68W	P		9:24	9:31		9:35	9:40	9:48	9:50	9:55	10:06
69	69W	K		9:53		10:01	10:05	10:10	10:18	Out of service		
70	70W	P		10:24	10:31		10:35	10:40	10:48	Out of service		
71	71W	K		10:53		11:01	11:05	11:10	11:18	Out of service		

Revised Route 110 /WESTbound

Advanced Chapter 3/ Blocking

Block #	Trip #	Via	Lv DVC	CLD	Arr CON	Lv CON	CLT	CLA	CKP	MYV	Arr WAS	Arr MCC
1	- 1E	P				4:43	4:49	4:53		4:57	5:04	
2	- 2E	K				4:59	5:05	5:09	5:13		5:21	
3	- 3E	P				5:05	5:11	5:15		5:19	5:27	
4	- 4E	M				5:21	5:27	5:31			5:34	5:42
5	- 5E	K				5:36	5:44	5:49	5:53		6:02	
6	- 6E	P				5:45	5:53	5:58		6:03	6:11	
7	- 7E	M	5:30	5:40	5:46	5:52	6:00	6:05			6:09	6:17
8	- 8E	K	5:44	5:55	6:02	6:06	6:14	6:19	6:23		6:32	
9	- 9E	P	5:54	6:05	6:12	6:15	6:23	6:28		6:33	6:41	
10	- 10E	M	6:00	6:11	6:18	6:22	6:30	6:35			6:39	6:47
11	- 11E	K	6:14	6:25	6:32	6:36	6:44	6:49	6:53		7:02	
12	- 12E	P	6:23	6:34	6:41	6:45	6:53	6:58		7:03	7:11	
13	- 13E	M	6:38	6:49	6:56	6:58	7:06	7:11			7:15	7:23
14	- 14E	K	6:53	7:04	7:11	7:13	7:21	7:26	7:30		7:39	
15	- 15E	P	7:08	7:19	7:26	7:29	7:37	7:42		7:47	7:55	
16	- 16E	M	7:14	7:25	7:32	7:34	7:42	7:47			7:47	7:55
17	- 17E	K	7:24	7:35	7:42	7:43	7:51	7:56	8:00		8:09	
18	- 18E	K	7:34	7:45	7:52	7:53	8:00	8:04	8:07		8:14	
19	- 19E	P	7:44	7:55	8:02	8:04	8:12	8:17		8:22	8:29	
20	- 20E	M	7:55	8:06	8:13	8:15	8:23	8:28			8:32	8:40
21	- 21E	K	8:10	8:21	8:28	8:30	8:38	8:43	8:47		8:55	
22	- 22E	P	8:25	8:36	8:43	8:45	8:53	8:58		9:02	9:09	
23	- 23E	M	8:45	8:56	9:03	9:05	9:13	9:18			9:21	9:29
24	- 24E	K	9:05	9:16	9:23	9:25	9:33	9:38	9:42		9:50	
25	- 25E	P	9:25	9:36	9:43	9:45	9:53	9:58		10:02	10:09	
26	- 26E	M	9:45	9:56	10:03	10:05	10:13	10:18			10:21	10:29
27	- 27E	K	10:05	10:16	10:22	10:25	10:38	10:42	10:42		10:50	
28	- 28E	P	10:25	10:36	10:42	10:45	10:53	10:58		11:02	11:09	
29	- 29E	M	10:45	10:56	11:02	11:05	11:13	11:18			11:21	11:29
30	- 30E	K	11:05	11:16	11:22	11:25	11:33	11:38	11:42		11:50	
31	- 31E	P	11:25	11:36	11:42	11:45	11:53	11:58		12:02	12:09	
32	- 32E	M	11:45	11:56	12:02	12:05	12:13	12:18			12:21	12:29
33	- 33E	K	12:05	12:16	12:22	12:25	12:33	12:38	12:42		12:49	
34	- 34E	P	12:25	12:36	12:42	12:45	12:53	12:58		1:02	1:09	
35	- 35E	M	12:45	12:56	1:02	1:05	1:13	1:18			1:21	1:29
36	- 36E	K	1:05	1:16	1:22	1:25	1:33	1:38	1:42		1:49	
37	- 37E	P	1:25	1:36	1:42	1:45	1:53	1:58		2:02	2:09	
38	- 38E	M	1:45	1:56	2:02	2:05	2:13	2:18			2:21	2:29
39	- 39E	K	2:01	2:14	2:21	2:24	2:33	2:39	2:44		2:54	
40	- 40E	P	2:20	2:33	2:40	2:43	2:52	2:58		3:03	3:12	
41	- 41E	M	2:40	2:53	3:00	3:03	3:12	3:18			3:22	3:36
42	- 42E	K	3:00	3:13	3:20	3:24	3:33	3:39	3:44		3:54	
43	- 43E	P	3:20	3:33	3:40	3:44	3:53	3:59		4:04	4:13	
44	- 44E	M	3:40	3:53	4:00	4:02	4:11	4:17			4:21	4:35
45	- 45E	K				4:12	4:22	4:29	4:34		4:44	
46	- 46E	P	3:55	4:08	4:16	4:20	4:30	4:37		4:42	4:50	
47	- 47E	M	4:15	4:28	4:36	4:40	4:50	4:57			5:00	5:14
48	- 48E	K				4:50	5:00	5:07	5:12		5:22	
49	- 49E	P	4:35	4:48	4:56	5:00	5:10	5:17		5:22	5:30	
50	- 50E	M				5:10	5:20	5:27			5:30	5:44
51	- 51E	K	4:55	5:08	5:16	5:20	5:30	5:37	5:42		5:52	
52	- 52E	P				5:30	5:40	5:47		5:52	6:00	
53	- 53E	M	5:15	5:28	5:36	5:40	5:50	5:57			6:00	6:14
54	- 54E	K	5:25	5:38	5:46	5:50	6:00	6:07	6:12		6:22	
55	- 55E	P	5:35	5:48	5:56	6:00	6:10	6:17		6:22	6:30	
56	- 56E	M	5:45	5:58	6:00	6:10	6:20	6:27			6:30	6:44
57	- 57E	K	5:55	6:08	6:16	6:20	6:30	6:37	6:42		6:52	
58	- 58E	P	6:05	6:18	6:26	6:30	6:40	6:47		6:52	7:00	
59	- 59E	M	6:20	6:33	6:41	6:45	6:55	7:02			7:05	7:17
60	- 60E	P	6:35	6:48	6:56	7:00	7:07	7:12	7:16		7:24	
61	- 61E	K	6:50	7:03	7:11	7:15	7:22	7:27		7:31	7:38	
62	- 62E	M	7:10	7:21	7:27	7:30	7:37	7:42			7:45	7:57
63	- 63E	K	7:30	7:41	7:47	7:50	7:57	8:02	8:06		8:14	
64	- 64E	P	7:50	8:01	8:07	8:10	8:17	8:22		8:26	8:33	
65	- 65E	M	8:10	8:21	8:27	8:30	8:37	8:42			8:45	8:57
66	- 66E	K	8:40	8:51	8:57	9:00	9:07	9:12	9:16		9:24	
67	- 67E	P	9:10	9:21	9:27	9:30	9:37	9:42		9:46	9:53	
68	- 68E	K	9:40	9:51	9:57	10:00	10:07	10:12	10:16		10:24	
69	- 69E	P	10:10	10:21	10:27	10:30	10:37	10:42		10:46	10:53	

J. Revised block summary recap

BLOCK SUMMARY RECAP								
Route #: 110			Special Instructions:					
Date: xx/xx/xx								
Scheduler:								
BLOCK NO.	PULL-OUT TIME	PULL-ON LOCATION	FIRST REVENUE TIME	LAST REVENUE TIME	PULL-OFF LOCATION	PULL-IN TIME	REVENUE HOURS	PLATFORM HOURS
1	4:36A	CON	4:43A	9:24A	CON	9:31P	16:41	16:55
2	4:52A	CON	4:59A	7:52P	CON	7:59P	14:53	15:07
3	4:58A	CON	5:05A	9:25A	CON	9:32A	4:20	4:34
4	5:14A	CON	5:21A	8:24P	CON	8:31P	15:03	15:17
5	5:29A	CON	5:36A	10:18P	CON	10:25P	16:42	16:56
6	5:38A	CON	5:45A	8:24A	CON	8:31A	2:39	2:53
7	5:18A	DVC	5:30A	10:48P	CON	10:55P	17:18	17:37
8	5:32A	DVC	5:44A	8:38A	CON	8:45A	2:54	3:13
9	5:48A	DVC	6:00A	8:56A	CON	9:03A	2:56	3:15
10	2:48P	DVC	3:00P	11:18P	CON	11:25P	8:18	8:37
11	4:05P	CON	4:12P	7:24P	DVC	7:36P	3:12	3:31
12	4:43P	CON	4:50P	7:47P	CON	7:54P	2:57	3:11
13	5:03P	CON	5:10P	6:34P	DVC	6:46P	1:24	1:43
14	5:23P	CON	5:30P	6:54P	DVC	7:06P	1:24	1:43
15	5:28P	CON	5:35P	7:41P	DVC	7:53P	2:06	2:25
16S	2:09P	WAS	2:44P	2:51P	CKP	3:16P	:07	1:07
Total							112:54	118:04

Finalized Route 110 block summary recap

CHAPTER 3: EXERCISES

- Block the Saturday Master Schedule for Route 110 below.
- Complete the Block Summary Recap below.
- Plot the Saturday blocks on the Block Graph on the following page.

Trip #	Via	Lv DVC	Arr CLD	Lv CON	Arr CON	CLT	CLA	CKP	MYV	Arr WAS	Arr MCC	Trip #	Via	Lv MCC	Lv WAS	MYV	CKP	CLA	CLT	Arr CON	Lv CON	Arr FRY	Lv DVC
1E	P		Into Service	6:55	7:03	7:08			7:12	7:19		1W	P		6:54	7:01		7:05	7:10	7:19	7:34	7:40	7:53
2E	K		Into Service	7:25	7:33	7:38	7:42			7:50		2W	K		7:24		7:33	8:05	8:10	8:19	8:34	8:40	8:53
3E	P		Into Service	7:55	8:03	8:08			8:12	8:19		4W	K		8:24		8:33	8:37	8:42	8:51	9:04	9:10	9:23
4E	K	7:58	8:09	8:15	8:25	8:33	8:38	8:42		8:50		5W	P		8:54	9:01		9:05	9:10	9:19	9:34	9:40	9:53
5E	P	8:28	8:39	8:45	8:55	9:03	9:08		9:12	9:19		6W	K		9:24		9:33	9:37	9:42	9:51	10:04	10:10	10:23
6E	K	8:58	9:09	9:15	9:25	9:33	9:38	9:42		9:50		7W	P		9:54	10:01		10:05	10:10	10:19	10:34	10:40	10:53
7E	P	9:28	9:39	9:45	9:55	10:03	10:08		10:12	10:19		8W	K		10:24		10:33	10:37	10:42	10:51	11:04	11:10	11:23
8E	K	9:58	10:09	10:15	10:25	10:33	10:38	10:42		10:50		9W	P		10:54	11:01		11:05	11:10	11:19	11:34	11:40	11:53
9E	P	10:28	10:39	10:45	10:55	11:03	11:08		11:12	11:19		10W	K		11:24		11:33	11:37	11:42	11:51	12:04	12:10	12:23
10E	K	10:58	11:09	11:15	11:25	11:33	11:38	11:42		11:50		11W	P		11:54	12:01		12:05	12:10	12:19	12:34	12:40	12:53
11E	P	11:28	11:39	11:45	11:55	12:03	12:08		12:12	12:19		12W	K		12:24		12:33	12:37	12:42	12:51	13:04	13:10	13:23
12E	K	11:58	12:09	12:15	12:25	12:33	12:38	12:42		12:50		13W	P		12:54	13:01		13:05	13:10	13:19	13:34	13:40	13:53
13E	P	12:28	12:39	12:45	12:55	13:03	13:08		13:12	13:19		14W	K		13:24		13:33	13:37	13:42	13:51	14:04	14:10	14:23
14E	K	12:58	13:09	13:15	13:25	13:33	13:38	13:42		13:50		15W	P		13:54	14:01		14:05	14:10	14:19	14:34	14:40	14:53
15E	P	13:28	13:39	13:45	13:55	14:03	14:08		14:12	14:19		16W	K		14:24		14:33	14:37	14:42	14:51	15:04	15:10	15:23
16E	K	13:58	14:09	14:15	14:25	14:33	14:38	14:42		14:50		17W	P		14:54	15:01		15:05	15:11	15:21	15:34	15:40	15:53
17E	P	14:28	14:39	14:45	14:55	15:03	15:10		15:15	15:23		18W	K		15:23		15:32	15:37	15:43	15:53	16:04	16:10	16:23
18E	K	14:57	15:08	15:16	15:23	15:33	15:40	15:45		15:55		19W	P		15:55	16:02		16:06	16:12	16:22	16:34	16:40	16:53
19E	P	15:25	15:38	15:46	15:53	16:03	16:10		16:15	16:23		20W	K		16:23		16:32	16:37	16:43	16:53	17:04	17:10	17:23
20E	K	15:55	16:08	16:16	16:23	16:33	16:40	16:45		16:55		21W	P		16:55	17:02		17:06	17:12	17:22	17:34	17:40	17:53
21E	P	16:25	16:38	16:46	16:54	17:04	17:11		17:16	17:24		22W	K		17:24		17:33	17:38	17:44	17:52	18:04	18:10	18:23
22E	K	16:55	17:08	17:16	17:24	17:34	17:41	17:46		17:56		23W	P		17:56	18:03		18:07	18:12	18:21	18:34	18:40	18:53
23E	P	17:25	17:38	17:46	17:54	18:04	18:11		18:16	18:24		24W	K		18:24		18:33	18:37	18:42	18:51	19:04	19:10	19:23
24E	K	17:58	18:09	18:15	18:25	18:33	18:38	18:42		18:50		25W	P		18:54	19:01		19:05	19:10	19:19	19:34	19:40	19:53
25E	P	18:28	18:39	18:45	18:55	19:03	19:08		19:12	19:19		-	-	-	-	-	-	-	-	-	-	-	-
26E	K	18:58	19:09	19:15	19:25	19:33	19:38	19:42		19:50		26W	K		19:54		20:03	20:07	20:12	20:21	20:34	20:40	20:53
27E	P	19:58	20:09	20:15	20:25	20:33	20:38		20:42	20:49		27W	P		20:54	21:01		21:05	21:10	21:19	21:34	21:40	21:53
28E	K	20:58	21:09	21:15	21:25	21:33	21:38	21:42		21:50		-	-	-	-	-	-	-	-	-	-	-	-
29E	P	21:58	22:09	22:15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

BLOCK SUMMARY RECAP									
Route #:			110 - Saturday			Special Instructions:			
Date:			xx/xx/xx						
Scheduler:									
BLOCK NO.	PULL-OUT TIME	PULL-ON LOCATION	FIRST REVENUE TIME	LAST REVENUE TIME	PULL-OFF LOCATION	PULL-IN TIME	REVENUE HOURS	PLATFORM HOURS	
1									
Total									

Block No.	START/END OF REVENUE TIME																Revenue Hours				
	4a	5a	6a	7a	8a	9a	10a	11a	12p	1p	2p	3p	4p	5p	6p	7p		8p	9p	10p	11p
	Early AM		AM Peak			Base (Midday)					School		PM Peak			Evening			Night		
1																					

Block No.	START/END OF REVENUE TIME																Revenue Hours				
	4a	5a	6a	7a	8a	9a	10a	11a	12p	1p	2p	3p	4p	5p	6p	7p		8p	9p	10p	11p

Route 110 Saturday blocks

Block No.	START/END OF REVENUE TIME														Revenue						
	4a	5a	6a	7a	8a	9a	10a	11a	12p	1p	2p	3p	4p	5p	6p	7p	8p	9p	10p	11p	Hours
	Early AM		AM Peak			Base (Midday)					School		PM Peak			Evening		Night			
1			654a																	1015p	15:21
2			655a																	719p	12:24
3			725a																	950p	14:25
4			755a																	723p	11:28
Block No.	START/END OF REVENUE TIME																53:38				
	4a	5a	6a	7a	8a	9a	10a	11a	12p	1p	2p	3p	4p	5p	6p	7p	8p	9p	10p	11p	

Route 110 Saturday blocks

Notes: