

## **BOAT-WAIT METHODOLOGY**

This appendix describes the methodology and assumptions behind the calculation of boat-wait for vehicles and passengers. Because typical levels of service for highways (based on congestion, average speeds, and total travel time) do not readily apply to ferry service, WSF developed boat-wait as an alternative method for measuring ferry service.

Throughout this appendix, the Edmonds-Kingston route in 2030 under Draft Plan service assumptions will be used to provide an example of the methodology. Each route, however, has its own individual arrival pattern profile that was used to calculate boat-wait; those patterns are presented in an Attachment to this Appendix.

### **MEASURING WAIT TIME FOR VEHICLES**

#### **Development of the Queue**

On a Wednesday in May of 2003, WSF measured the arrival rate and queue pattern at all of its terminals. The resulting data provides a timestamp for every vehicle that boarded a sailing in the 4-hour PM commute period on that day. Using this information, it is possible to determine how many vehicles arrive each minute. Exhibit 1 below displays this information for Edmonds-Kingston and shows a total commute-period demand of 950 vehicles on that Wednesday in May 2003.

For each route, there are also projections of the total commute-period vehicle demand for all years through 2030. For Edmonds-Kingston, under the Draft Plan, vehicle demand in 2030 is 1,567, or 165% of 2003 demand. Therefore, the number of arrivals is scaled up in each minute by 165%.

The average size of vehicles on each route is also taken into account when adjusting arrivals. Routes popular with commuters tend to have smaller vehicle-equivalents because of the popularity of motorcycles. For instance, the Seattle-Bainbridge route has a vehicle-equivalency factor of 0.89, which means that, on average, 100 vehicles on the Seattle-Bainbridge route will only take up the equivalent of 89 standard vehicle spaces. Edmonds-Kingston's vehicle-equivalency factor is 0.98, so the scaled up number of arrivals (scaled by 165%) is multiplied by 0.98 to arrive at the modeled number of arrivals for 2030, which are displayed in Exhibit 2. Versions of Exhibit 2 for other modeled routes under Draft Plan service assumptions can be found in the Attachment at the end of this Appendix.

On some routes, the sailing before the beginning of the commute period can be full, leading to overflow vehicles that are already in line before the commute period begins. The number of overflow vehicles is modeled by using demand data by sailing from a Wednesday in May 2003. For instance, on Edmonds-Kingston, there was a demand of 161 vehicles on the pre-commute-period sailing in 2003. That demand is scaled up to 266 in 2030, and since the Draft Plan calls for four vessels, each with vehicle capacity of 144, the overflow will be 122 vehicles (266 – 144).

With knowledge of the amount of overflow from the pre-commute-period sailing and the adjusted arrival rate in 2030, the queue can begin to be modeled. The other important inputs in modeling the queue are the timing and capacity of vessel departures, as shown in Exhibit 3 (note that Exhibit 3 displays the queue over the 4-hour commute period, not the arrival period shown in earlier exhibits).



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## Exhibit 1: Edmonds-Kingston 2003 Vehicle Arrivals

Time	Vehicles Arriving, 2003	Time	Vehicles Arriving, 2003	Time	Vehicles Arriving, 2003	Time	Vehicles Arriving, 2003
2:32 PM	1	3:32 PM	5	4:32 PM	6	5:32 PM	7
2:33 PM	2	3:33 PM	4	4:33 PM	1	5:33 PM	4
2:34 PM	1	3:34 PM	2	4:34 PM	3	5:34 PM	14
2:35 PM	2	3:35 PM	2	4:35 PM	1	5:35 PM	1
2:36 PM	5	3:36 PM	1	4:36 PM	3	5:36 PM	6
2:37 PM	1	3:37 PM	4	4:37 PM	3	5:37 PM	7
2:38 PM	2	3:38 PM	4	4:38 PM	5	5:38 PM	2
2:39 PM	3	3:39 PM	1	4:39 PM	7	5:39 PM	8
2:40 PM	0	3:40 PM	7	4:40 PM	11	5:40 PM	11
2:41 PM	5	3:41 PM	9	4:41 PM	7	5:41 PM	6
2:42 PM	2	3:42 PM	1	4:42 PM	8	5:42 PM	8
2:43 PM	2	3:43 PM	0	4:43 PM	3	5:43 PM	4
2:44 PM	5	3:44 PM	6	4:44 PM	4	5:44 PM	4
2:45 PM	5	3:45 PM	3	4:45 PM	2	5:45 PM	3
2:46 PM	7	3:46 PM	6	4:46 PM	4	5:46 PM	1
2:47 PM	4	3:47 PM	1	4:47 PM	9	5:47 PM	7
2:48 PM	7	3:48 PM	1	4:48 PM	11	5:48 PM	4
2:49 PM	5	3:49 PM	1	4:49 PM	3	5:49 PM	1
2:50 PM	8	3:50 PM	5	4:50 PM	2	5:50 PM	1
2:51 PM	1	3:51 PM	2	4:51 PM	4	5:51 PM	2
2:52 PM	5	3:52 PM	3	4:52 PM	5	5:52 PM	3
2:53 PM	9	3:53 PM	1	4:53 PM	4	5:53 PM	1
2:54 PM	5	3:54 PM	5	4:54 PM	6	5:54 PM	2
2:55 PM	3	3:55 PM	1	4:55 PM	4	5:55 PM	3
2:56 PM	2	3:56 PM	3	4:56 PM	8	5:56 PM	1
2:57 PM	5	3:57 PM	7	4:57 PM	0	5:57 PM	3
2:58 PM	4	3:58 PM	7	4:58 PM	1	5:58 PM	5
2:59 PM	11	3:59 PM	3	4:59 PM	10	5:59 PM	5
3:00 PM	5	4:00 PM	5	5:00 PM	6	6:00 PM	3
3:01 PM	0	4:01 PM	6	5:01 PM	5	6:01 PM	0
3:02 PM	3	4:02 PM	7	5:02 PM	3	6:02 PM	2
3:03 PM	3	4:03 PM	7	5:03 PM	3	6:03 PM	8
3:04 PM	2	4:04 PM	7	5:04 PM	0	6:04 PM	2
3:05 PM	4	4:05 PM	5	5:05 PM	1	6:05 PM	3
3:06 PM	1	4:06 PM	7	5:06 PM	1	6:06 PM	1
3:07 PM	0	4:07 PM	7	5:07 PM	4	6:07 PM	3
3:08 PM	2	4:08 PM	5	5:08 PM	7	6:08 PM	5
3:09 PM	7	4:09 PM	5	5:09 PM	2	6:09 PM	4
3:10 PM	2	4:10 PM	3	5:10 PM	1	6:10 PM	1
3:11 PM	2	4:11 PM	3	5:11 PM	5	6:11 PM	4
3:12 PM	5	4:12 PM	6	5:12 PM	3	6:12 PM	2
3:13 PM	5	4:13 PM	4	5:13 PM	3	6:13 PM	2
3:14 PM	5	4:14 PM	5	5:14 PM	0	6:14 PM	8
3:15 PM	2	4:15 PM	3	5:15 PM	2	6:15 PM	4
3:16 PM	2	4:16 PM	7	5:16 PM	5	6:16 PM	1
3:17 PM	3	4:17 PM	2	5:17 PM	4	6:17 PM	4
3:18 PM	6	4:18 PM	3	5:18 PM	0	6:18 PM	4
3:19 PM	3	4:19 PM	10	5:19 PM	0	6:19 PM	7
3:20 PM	2	4:20 PM	2	5:20 PM	3	6:20 PM	3
3:21 PM	4	4:21 PM	7	5:21 PM	7	6:21 PM	5
3:22 PM	6	4:22 PM	2	5:22 PM	7	6:22 PM	4
3:23 PM	3	4:23 PM	6	5:23 PM	4	6:23 PM	5
3:24 PM	6	4:24 PM	3	5:24 PM	3	6:24 PM	7
3:25 PM	3	4:25 PM	5	5:25 PM	2	6:25 PM	5
3:26 PM	4	4:26 PM	5	5:26 PM	1	6:26 PM	3
3:27 PM	8	4:27 PM	2	5:27 PM	8	6:27 PM	2
3:28 PM	5	4:28 PM	4	5:28 PM	4	6:28 PM	4
3:29 PM	5	4:29 PM	3	5:29 PM	2	6:29 PM	2
3:30 PM	3	4:30 PM	5	5:30 PM	4	6:30 PM	1
3:31 PM	2	4:31 PM	5	5:31 PM	5	6:31 PM	1

## APPENDIX B: BOAT-WAIT METHODOLOGY

### Exhibit 2: Edmonds-Kingston 2030 Adjusted Vehicle Arrivals

Time	Adjusted Vehicles Arriving,		Time	Adjusted Vehicles Arriving,		Time	Adjusted Vehicles Arriving,		Time	Adjusted Vehicles Arriving,	
	2003	2030		2003	2030		2003	2030		2003	2030
2:32 PM	1	2	3:32 PM	5	8	4:32 PM	6	10	5:32 PM	7	11
2:33 PM	2	3	3:33 PM	4	6	4:33 PM	1	2	5:33 PM	4	6
2:34 PM	1	2	3:34 PM	2	3	4:34 PM	3	5	5:34 PM	14	23
2:35 PM	2	3	3:35 PM	2	3	4:35 PM	1	2	5:35 PM	1	2
2:36 PM	5	8	3:36 PM	1	2	4:36 PM	3	5	5:36 PM	6	10
2:37 PM	1	2	3:37 PM	4	6	4:37 PM	3	5	5:37 PM	7	11
2:38 PM	2	3	3:38 PM	4	6	4:38 PM	5	8	5:38 PM	2	3
2:39 PM	3	5	3:39 PM	1	2	4:39 PM	7	11	5:39 PM	8	13
2:40 PM	0	0	3:40 PM	7	11	4:40 PM	11	18	5:40 PM	11	18
2:41 PM	5	8	3:41 PM	9	15	4:41 PM	7	11	5:41 PM	6	10
2:42 PM	2	3	3:42 PM	1	2	4:42 PM	8	13	5:42 PM	8	13
2:43 PM	2	3	3:43 PM	0	0	4:43 PM	3	5	5:43 PM	4	6
2:44 PM	5	8	3:44 PM	6	10	4:44 PM	4	6	5:44 PM	4	6
2:45 PM	5	8	3:45 PM	3	5	4:45 PM	2	3	5:45 PM	3	5
2:46 PM	7	11	3:46 PM	6	10	4:46 PM	4	6	5:46 PM	1	2
2:47 PM	4	6	3:47 PM	1	2	4:47 PM	9	15	5:47 PM	7	11
2:48 PM	7	11	3:48 PM	1	2	4:48 PM	11	18	5:48 PM	4	6
2:49 PM	5	8	3:49 PM	1	2	4:49 PM	3	5	5:49 PM	1	2
2:50 PM	8	13	3:50 PM	5	8	4:50 PM	2	3	5:50 PM	1	2
2:51 PM	1	2	3:51 PM	2	3	4:51 PM	4	6	5:51 PM	2	3
2:52 PM	5	8	3:52 PM	3	5	4:52 PM	5	8	5:52 PM	3	5
2:53 PM	9	15	3:53 PM	1	2	4:53 PM	4	6	5:53 PM	1	2
2:54 PM	5	8	3:54 PM	5	8	4:54 PM	6	10	5:54 PM	2	3
2:55 PM	3	5	3:55 PM	1	2	4:55 PM	4	6	5:55 PM	3	5
2:56 PM	2	3	3:56 PM	3	5	4:56 PM	8	13	5:56 PM	1	2
2:57 PM	5	8	3:57 PM	7	11	4:57 PM	0	0	5:57 PM	3	5
2:58 PM	4	6	3:58 PM	7	11	4:58 PM	1	2	5:58 PM	5	8
2:59 PM	11	18	3:59 PM	3	5	4:59 PM	10	16	5:59 PM	5	8
3:00 PM	5	8	4:00 PM	5	8	5:00 PM	6	10	6:00 PM	3	5
3:01 PM	0	0	4:01 PM	6	10	5:01 PM	5	8	6:01 PM	0	0
3:02 PM	3	5	4:02 PM	7	11	5:02 PM	3	5	6:02 PM	2	3
3:03 PM	3	5	4:03 PM	7	11	5:03 PM	3	5	6:03 PM	8	13
3:04 PM	2	3	4:04 PM	7	11	5:04 PM	0	0	6:04 PM	2	3
3:05 PM	4	6	4:05 PM	5	8	5:05 PM	1	2	6:05 PM	3	5
3:06 PM	1	2	4:06 PM	7	11	5:06 PM	1	2	6:06 PM	1	2
3:07 PM	0	0	4:07 PM	7	11	5:07 PM	4	6	6:07 PM	3	5
3:08 PM	2	3	4:08 PM	5	8	5:08 PM	7	11	6:08 PM	5	8
3:09 PM	7	11	4:09 PM	5	8	5:09 PM	2	3	6:09 PM	4	6
3:10 PM	2	3	4:10 PM	3	5	5:10 PM	1	2	6:10 PM	1	2
3:11 PM	2	3	4:11 PM	3	5	5:11 PM	5	8	6:11 PM	4	6
3:12 PM	5	8	4:12 PM	6	10	5:12 PM	3	5	6:12 PM	2	3
3:13 PM	5	8	4:13 PM	4	6	5:13 PM	3	5	6:13 PM	2	3
3:14 PM	5	8	4:14 PM	5	8	5:14 PM	0	0	6:14 PM	8	13
3:15 PM	2	3	4:15 PM	3	5	5:15 PM	2	3	6:15 PM	4	6
3:16 PM	2	3	4:16 PM	7	11	5:16 PM	5	8	6:16 PM	1	2
3:17 PM	3	5	4:17 PM	2	3	5:17 PM	4	6	6:17 PM	4	6
3:18 PM	6	10	4:18 PM	3	5	5:18 PM	0	0	6:18 PM	4	6
3:19 PM	3	5	4:19 PM	10	16	5:19 PM	0	0	6:19 PM	7	11
3:20 PM	2	3	4:20 PM	2	3	5:20 PM	3	5	6:20 PM	3	5
3:21 PM	4	6	4:21 PM	7	11	5:21 PM	7	11	6:21 PM	5	8
3:22 PM	6	10	4:22 PM	2	3	5:22 PM	7	11	6:22 PM	4	6
3:23 PM	3	5	4:23 PM	6	10	5:23 PM	4	6	6:23 PM	5	8
3:24 PM	6	10	4:24 PM	3	5	5:24 PM	3	5	6:24 PM	7	11
3:25 PM	3	5	4:25 PM	5	8	5:25 PM	2	3	6:25 PM	5	8
3:26 PM	4	6	4:26 PM	5	8	5:26 PM	1	2	6:26 PM	3	5
3:27 PM	8	13	4:27 PM	2	3	5:27 PM	8	13	6:27 PM	2	3
3:28 PM	5	8	4:28 PM	4	6	5:28 PM	4	6	6:28 PM	4	6
3:29 PM	5	8	4:29 PM	3	5	5:29 PM	2	3	6:29 PM	2	3
3:30 PM	3	5	4:30 PM	5	8	5:30 PM	4	6	6:30 PM	1	2
3:31 PM	2	3	4:31 PM	5	8	5:31 PM	5	8	6:31 PM	1	2



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## Exhibit 3: Edmonds-Kingston 2030 Modeled Vehicle Queue

Adjusted Vehicles				Adjusted Vehicles				Adjusted Vehicles				Adjusted Vehicles			
Vehicles Arriving,		Departing,		Vehicles Arriving,		Departing,		Vehicles Arriving,		Departing,		Vehicles Arriving,		Departing,	
Time	2030	2030	Queue	Time	2030	2030	Queue	Time	2030	2030	Queue	Time	2030	2030	Queue
Start of Commute Period			303												
3:00 PM	8	144	167	4:00 PM	8	144	71	5:00 PM	10	144	111	6:00 PM	5	144	44
3:01 PM	0		167	4:01 PM	10		81	5:01 PM	8		119	6:01 PM	0		44
3:02 PM	5		172	4:02 PM	11		92	5:02 PM	5		124	6:02 PM	3		47
3:03 PM	5		176	4:03 PM	11		103	5:03 PM	5		129	6:03 PM	13		60
3:04 PM	3		180	4:04 PM	11		115	5:04 PM	0		129	6:04 PM	3		64
3:05 PM	6		186	4:05 PM	8		123	5:05 PM	2		130	6:05 PM	5		69
3:06 PM	2		188	4:06 PM	11		134	5:06 PM	2		132	6:06 PM	2		70
3:07 PM	0		188	4:07 PM	11		145	5:07 PM	6		138	6:07 PM	5		75
3:08 PM	3		191	4:08 PM	8		153	5:08 PM	11		150	6:08 PM	8		83
3:09 PM	11		202	4:09 PM	8		161	5:09 PM	3		153	6:09 PM	6		90
3:10 PM	3		205	4:10 PM	5		166	5:10 PM	2		155	6:10 PM	2		91
3:11 PM	3		209	4:11 PM	5		171	5:11 PM	8		163	6:11 PM	6		98
3:12 PM	8		217	4:12 PM	10		181	5:12 PM	5		168	6:12 PM	3		101
3:13 PM	8		225	4:13 PM	6		187	5:13 PM	5		172	6:13 PM	3		104
3:14 PM	8		233	4:14 PM	8		195	5:14 PM	0		172	6:14 PM	13		117
3:15 PM	3		236	4:15 PM	5		200	5:15 PM	3		176	6:15 PM	6		123
3:16 PM	3		239	4:16 PM	11		212	5:16 PM	8		184	6:16 PM	2		125
3:17 PM	5		244	4:17 PM	3		215	5:17 PM	6		190	6:17 PM	6		132
3:18 PM	10		254	4:18 PM	5		220	5:18 PM	0		190	6:18 PM	6		138
3:19 PM	5		259	4:19 PM	16		236	5:19 PM	0		190	6:19 PM	11		149
3:20 PM	3	144	118	4:20 PM	3	144	95	5:20 PM	5	144	51	6:20 PM	5	144	10
3:21 PM	6		125	4:21 PM	11		106	5:21 PM	11		62	6:21 PM	8		18
3:22 PM	10		134	4:22 PM	3		110	5:22 PM	11		74	6:22 PM	6		25
3:23 PM	5		139	4:23 PM	10		119	5:23 PM	6		80	6:23 PM	8		33
3:24 PM	10		149	4:24 PM	5		124	5:24 PM	5		85	6:24 PM	11		44
3:25 PM	5		154	4:25 PM	8		132	5:25 PM	3		88	6:25 PM	8		52
3:26 PM	6		160	4:26 PM	8		140	5:26 PM	2		90	6:26 PM	5		57
3:27 PM	13		173	4:27 PM	3		144	5:27 PM	13		103	6:27 PM	3		60
3:28 PM	8		181	4:28 PM	6		150	5:28 PM	6		109	6:28 PM	6		67
3:29 PM	8		189	4:29 PM	5		155	5:29 PM	3		112	6:29 PM	3		70
3:30 PM	5		194	4:30 PM	8		163	5:30 PM	6		119	6:30 PM	2		72
3:31 PM	3		197	4:31 PM	8		171	5:31 PM	8		127	6:31 PM	2		73
3:32 PM	8		205	4:32 PM	10		181	5:32 PM	11		138	6:32 PM	0		73
3:33 PM	6		212	4:33 PM	2		182	5:33 PM	6		145	6:33 PM	0		73
3:34 PM	3		215	4:34 PM	5		187	5:34 PM	23		167	6:34 PM	0		73
3:35 PM	3		218	4:35 PM	2		189	5:35 PM	2		169	6:35 PM	0		73
3:36 PM	2		220	4:36 PM	5		194	5:36 PM	10		179	6:36 PM	0		73
3:37 PM	6		226	4:37 PM	5		198	5:37 PM	11		190	6:37 PM	0		73
3:38 PM	6		233	4:38 PM	8		207	5:38 PM	3		193	6:38 PM	0		73
3:39 PM	2		234	4:39 PM	11		218	5:39 PM	13		206	6:39 PM	0		73
3:40 PM	11	144	102	4:40 PM	18	144	92	5:40 PM	18	144	80	6:40 PM	0	144	0
3:41 PM	15		116	4:41 PM	11		103	5:41 PM	10		90	6:41 PM	0		0
3:42 PM	2		118	4:42 PM	13		116	5:42 PM	13		103	6:42 PM	0		0
3:43 PM	0		118	4:43 PM	5		121	5:43 PM	6		109	6:43 PM	0		0
3:44 PM	10		128	4:44 PM	6		127	5:44 PM	6		116	6:44 PM	0		0
3:45 PM	5		132	4:45 PM	3		130	5:45 PM	5		120	6:45 PM	0		0
3:46 PM	10		142	4:46 PM	6		137	5:46 PM	2		122	6:46 PM	0		0
3:47 PM	2		144	4:47 PM	15		151	5:47 PM	11		133	6:47 PM	0		0
3:48 PM	2		145	4:48 PM	18		169	5:48 PM	6		140	6:48 PM	0		0
3:49 PM	2		147	4:49 PM	5		174	5:49 PM	2		141	6:49 PM	0		0
3:50 PM	8		155	4:50 PM	3		177	5:50 PM	2		143	6:50 PM	0		0
3:51 PM	3		158	4:51 PM	6		184	5:51 PM	3		146	6:51 PM	0		0
3:52 PM	5		163	4:52 PM	8		192	5:52 PM	5		151	6:52 PM	0		0
3:53 PM	2		165	4:53 PM	6		198	5:53 PM	2		153	6:53 PM	0		0
3:54 PM	8		173	4:54 PM	10		208	5:54 PM	3		156	6:54 PM	0		0
3:55 PM	2		175	4:55 PM	6		215	5:55 PM	5		161	6:55 PM	0		0
3:56 PM	5		179	4:56 PM	13		227	5:56 PM	2		162	6:56 PM	0		0
3:57 PM	11		191	4:57 PM	0		227	5:57 PM	5		167	6:57 PM	0		0
3:58 PM	11		202	4:58 PM	2		229	5:58 PM	8		175	6:58 PM	0		0
3:59 PM	5		207	4:59 PM	16		245	5:59 PM	8		183	6:59 PM	0		0

### Determining Average Wait Time

The wait time for each vehicle is determined by subtracting its arrival time in the queue from its departure time on a vessel. Departure time for a vehicle is calculated by examining the length of the queue in front of the vehicle, and the times and capacities of upcoming sailings. For instance, the three vehicles arriving in the queue at 3:34 PM see a queue of 212 vehicles in front of them. They will not sail on the next vessel to leave, the 3:40 PM sailing, because it holds only 144 vehicles. However, once that sailing departs, there will be only 68 ( $212 - 144$ ) vehicles in front of them, so they will make it onto the 4:00 PM vessel, which also holds 144 vehicles. Therefore, the wait time for each of those three vehicles would be 26 minutes, from 3:34 PM to 4:00 PM.

That same calculation is performed for all vehicles arriving during the commute period (shown in Exhibit 4), and the average wait time is simply the average of each vehicle's individual wait time. For Edmonds-Kingston under the 2030 Draft Plan, the average wait time is 22 minutes, well better than the standard of 40 minutes on this route.



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## Exhibit 4: Edmonds-Kingston 2030 Modeled Vehicle Wait Times

Time	Adjusted Vehicles Arriving, 2030		Time	Adjusted Vehicles Arriving, 2030		Time	Adjusted Vehicles Arriving, 2030		Time	Adjusted Vehicles Arriving, 2030	
	Vehicles	Wait Time (Mins.)		Vehicles	Wait Time (Mins.)		Vehicles	Wait Time (Mins.)		Vehicles	Wait Time (Mins.)
3:00 PM	8	40	4:00 PM	8	20	5:00 PM	10	20	6:00 PM	5	20
3:01 PM	0	39	4:01 PM	10	19	5:01 PM	8	19	6:01 PM	0	19
3:02 PM	5	38	4:02 PM	11	18	5:02 PM	5	18	6:02 PM	3	18
3:03 PM	5	37	4:03 PM	11	17	5:03 PM	5	17	6:03 PM	13	17
3:04 PM	3	36	4:04 PM	11	16	5:04 PM	0	16	6:04 PM	3	16
3:05 PM	6	35	4:05 PM	8	15	5:05 PM	2	15	6:05 PM	5	15
3:06 PM	2	34	4:06 PM	11	14	5:06 PM	2	14	6:06 PM	2	14
3:07 PM	0	33	4:07 PM	11	33	5:07 PM	6	13	6:07 PM	5	13
3:08 PM	3	32	4:08 PM	8	32	5:08 PM	11	32	6:08 PM	8	12
3:09 PM	11	31	4:09 PM	8	31	5:09 PM	3	31	6:09 PM	6	11
3:10 PM	3	30	4:10 PM	5	30	5:10 PM	2	30	6:10 PM	2	10
3:11 PM	3	29	4:11 PM	5	29	5:11 PM	8	29	6:11 PM	6	9
3:12 PM	8	28	4:12 PM	10	28	5:12 PM	5	28	6:12 PM	3	8
3:13 PM	8	27	4:13 PM	6	27	5:13 PM	5	27	6:13 PM	3	7
3:14 PM	8	26	4:14 PM	8	26	5:14 PM	0	26	6:14 PM	13	6
3:15 PM	3	25	4:15 PM	5	25	5:15 PM	3	25	6:15 PM	6	5
3:16 PM	3	24	4:16 PM	11	24	5:16 PM	8	24	6:16 PM	2	4
3:17 PM	5	23	4:17 PM	3	23	5:17 PM	6	23	6:17 PM	6	3
3:18 PM	10	22	4:18 PM	5	22	5:18 PM	0	22	6:18 PM	6	2
3:19 PM	5	21	4:19 PM	16	21	5:19 PM	0	21	6:19 PM	11	21
3:20 PM	3	20	4:20 PM	3	20	5:20 PM	5	20	6:20 PM	5	20
3:21 PM	6	19	4:21 PM	11	19	5:21 PM	11	19	6:21 PM	8	19
3:22 PM	10	18	4:22 PM	3	18	5:22 PM	11	18	6:22 PM	6	18
3:23 PM	5	17	4:23 PM	10	17	5:23 PM	6	17	6:23 PM	8	17
3:24 PM	10	36	4:24 PM	5	16	5:24 PM	5	16	6:24 PM	11	16
3:25 PM	5	35	4:25 PM	8	15	5:25 PM	3	15	6:25 PM	8	15
3:26 PM	6	34	4:26 PM	8	14	5:26 PM	2	14	6:26 PM	5	14
3:27 PM	13	33	4:27 PM	3	13	5:27 PM	13	13	6:27 PM	3	13
3:28 PM	8	32	4:28 PM	6	32	5:28 PM	6	12	6:28 PM	6	12
3:29 PM	8	31	4:29 PM	5	31	5:29 PM	3	11	6:29 PM	3	11
3:30 PM	5	30	4:30 PM	8	30	5:30 PM	6	10	6:30 PM	2	10
3:31 PM	3	29	4:31 PM	8	29	5:31 PM	8	9	6:31 PM	2	9
3:32 PM	8	28	4:32 PM	10	28	5:32 PM	11	8	6:32 PM	0	8
3:33 PM	6	27	4:33 PM	2	27	5:33 PM	6	27	6:33 PM	0	7
3:34 PM	3	26	4:34 PM	5	26	5:34 PM	23	26	6:34 PM	0	6
3:35 PM	3	25	4:35 PM	2	25	5:35 PM	2	25	6:35 PM	0	5
3:36 PM	2	24	4:36 PM	5	24	5:36 PM	10	24	6:36 PM	0	4
3:37 PM	6	23	4:37 PM	5	23	5:37 PM	11	23	6:37 PM	0	3
3:38 PM	6	22	4:38 PM	8	22	5:38 PM	3	22	6:38 PM	0	2
3:39 PM	2	21	4:39 PM	11	21	5:39 PM	13	21	6:39 PM	0	1
3:40 PM	11	20	4:40 PM	18	20	5:40 PM	18	20	6:40 PM	0	20
3:41 PM	15	19	4:41 PM	11	19	5:41 PM	10	19	6:41 PM	0	19
3:42 PM	2	18	4:42 PM	13	18	5:42 PM	13	18	6:42 PM	0	18
3:43 PM	0	17	4:43 PM	5	17	5:43 PM	6	17	6:43 PM	0	17
3:44 PM	10	16	4:44 PM	6	16	5:44 PM	6	16	6:44 PM	0	16
3:45 PM	5	15	4:45 PM	3	15	5:45 PM	5	15	6:45 PM	0	15
3:46 PM	10	14	4:46 PM	6	14	5:46 PM	2	14	6:46 PM	0	14
3:47 PM	2	13	4:47 PM	15	33	5:47 PM	11	13	6:47 PM	0	13
3:48 PM	2	32	4:48 PM	18	32	5:48 PM	6	12	6:48 PM	0	12
3:49 PM	2	31	4:49 PM	5	31	5:49 PM	2	11	6:49 PM	0	11
3:50 PM	8	30	4:50 PM	3	30	5:50 PM	2	10	6:50 PM	0	10
3:51 PM	3	29	4:51 PM	6	29	5:51 PM	3	29	6:51 PM	0	9
3:52 PM	5	28	4:52 PM	8	28	5:52 PM	5	28	6:52 PM	0	8
3:53 PM	2	27	4:53 PM	6	27	5:53 PM	2	27	6:53 PM	0	7
3:54 PM	8	26	4:54 PM	10	26	5:54 PM	3	26	6:54 PM	0	6
3:55 PM	2	25	4:55 PM	6	25	5:55 PM	5	25	6:55 PM	0	5
3:56 PM	5	24	4:56 PM	13	24	5:56 PM	2	24	6:56 PM	0	4
3:57 PM	11	23	4:57 PM	0	23	5:57 PM	5	23	6:57 PM	0	3
3:58 PM	11	22	4:58 PM	2	22	5:58 PM	8	22	6:58 PM	0	2
3:59 PM	5	21	4:59 PM	16	21	5:59 PM	8	21	6:59 PM	0	1

**MEASURING BOAT-WAIT FOR PASSENGERS**

**Determining the Peak-of-the-Peak Sailing**

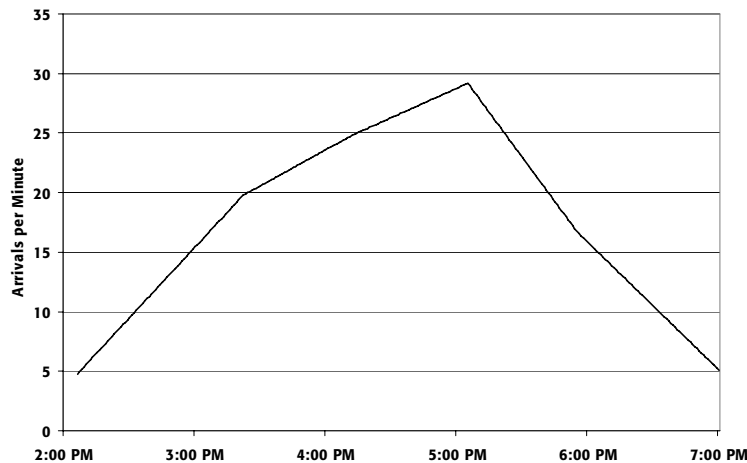
All routes have a 0-boat wait standard for walk-on passengers, meaning anyone seeking to travel as a walk-on should be able to find space on the sailing of their choice. To calculate when the 0-boat-wait pedestrian standard is exceeded, each route’s most popular sailing of the day – the “peak-of-the-peak” sailing – was determined. WSF’s data on 2003 PM peak traffic includes information on the sailing-by-sailing passenger demand only for the Seattle-Bainbridge route, displayed in Exhibit 5.

**Exhibit 5: Seattle-Bainbridge 2003**

<b>Passenger Demand</b>	
<b>Sailing</b>	<b>Passengers</b>
2:05 PM	429
3:00 PM	545
3:45 PM	890
4:40 PM	1365
5:30 PM	1459
6:20 PM	836
7:20 PM	414

This demand by sailing was translated into a by-minute demand curve by assuming a steadily accelerating and decelerating arrival pattern during each block of time between sailings. The by-minute demand curve is displayed in Exhibit 6.

**Exhibit 6: Seattle-Bainbridge 2003 Passenger Demand Curve**

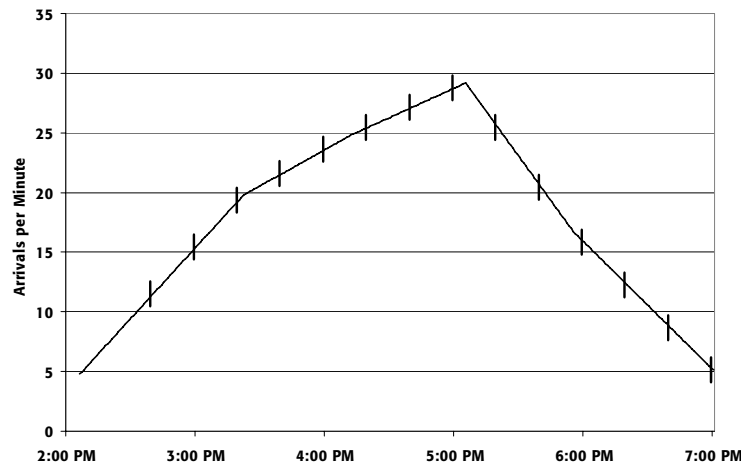


The demand curve was then applied to each route’s projected schedule to determine which sailing held the greatest proportion of the commute-period demand. For instance, on Edmonds-Kingston in 2030 under the Draft Plan level of service, vessels depart every twenty minutes, as shown in Exhibit 7 (vertical ticks represent sailings).



## WASHINGTON STATE FERRIES

**Exhibit 7: Seattle-Bainbridge 2003 Passenger Demand Curve, Edmonds-Kingston 2030 Draft Plan Sailings**



Examining Exhibit 7, it is clear that the highest-demand sailing is either the 5:00 PM or the 5:20 PM. As it turns out, the 5:20 PM has slightly higher demand (11.3% of the commute-period passenger demand versus 10.9% for the 5:00 PM sailing).

### **Determining Passenger Demand on the Peak-of-the-Peak Sailing**

Since the capacity of a sailing to accommodate walk-ons is related to the number of passengers arriving by vehicle, the number of in-vehicle passengers is estimated for each sailing, using projections of vehicle traffic and average vehicle occupancy. The estimate of in-vehicle passengers is the lower of the peak sailing demand and the vehicle capacity of the vessel multiplied by the average vehicle occupancy.

For example, in 2030 Edmonds-Kingston's 4-hour commute-period demand for westbound passengers traveling in vehicles (drivers plus in-vehicle passengers) under Draft Plan service is 2,717. To calculate the peak-of-the-peak demand for passengers traveling in vehicles, the 4-hour total is multiplied 11.3% (the expected peak sailing demand) to arrive at a figure of 307 for peak sailing demand. Based on the Draft Plan service schedule, a 144-car vessel would be operating on this route in 2030. The ridership analysis estimated average vehicle occupancy of 1.73 on this route, meaning that the total expected in-vehicle passengers on a full 144-car vessel would be 250 passengers. Since the capacity limit is lower than the demand estimate, 250 passengers is the assumed in-vehicle passenger count for the peak-of-the-peak sailing.

To estimate the peak-of-the-peak demand for walk-ons, the peak-of-the-peak share of 4-hour commute period (11.3%) is applied to the total commute-period walk-on demand (2,243) to arrive at the peak-of-the-peak walk-on demand. For Edmonds-Kingston, this figure is 253. To calculate total passenger demand, simply add the demand for passengers traveling in vehicles (250 for Edmonds-Kingston) to the demand for passengers walking on (253 for Edmonds-Kingston). Edmonds-Kingston's passenger demand in 2030 for the peak-of-the-peak sailing is estimated to be 503, or 34% of the 1,500-passenger capacity of the Expanded Issaquah-class vessel projected to operate on this route in 2030 under the Draft Plan. Since the demand is much less than the available capacity, then the 0-boat wait standard is met.

**ATTACHMENTS**

**Vehicle Arrival Patterns by Route,  
Actual Results for 2003 and Estimated for 2030**



# WASHINGTON STATE FERRIES

## Mukilteo-Clinton

Time	Adjusted Vehicles		Time	Adjusted Vehicles		Time	Adjusted Vehicles		Time	Adjusted Vehicles	
	Arriving, 2003	Arriving, 2030		Arriving, 2003	Arriving, 2030		Arriving, 2003	Arriving, 2030		Arriving, 2003	Arriving, 2030
2:00 PM	0	0	3:15 PM	3	5	4:30 PM	9	14	5:45 PM	3	5
2:01 PM	0	0	3:16 PM	4	6	4:31 PM	8	13	5:46 PM	4	6
2:02 PM	0	0	3:17 PM	4	6	4:32 PM	0	0	5:47 PM	9	14
2:03 PM	0	0	3:18 PM	15	24	4:33 PM	0	0	5:48 PM	3	5
2:04 PM	0	0	3:19 PM	4	6	4:34 PM	0	0	5:49 PM	0	0
2:05 PM	0	0	3:20 PM	5	8	4:35 PM	2	3	5:50 PM	3	5
2:06 PM	0	0	3:21 PM	4	6	4:36 PM	1	2	5:51 PM	3	5
2:07 PM	0	0	3:22 PM	4	6	4:37 PM	4	6	5:52 PM	5	8
2:08 PM	0	0	3:23 PM	4	6	4:38 PM	7	11	5:53 PM	10	16
2:09 PM	0	0	3:24 PM	4	6	4:39 PM	5	8	5:54 PM	8	13
2:10 PM	0	0	3:25 PM	3	5	4:40 PM	6	9	5:55 PM	8	13
2:11 PM	0	0	3:26 PM	0	0	4:41 PM	12	19	5:56 PM	3	5
2:12 PM	0	0	3:27 PM	0	0	4:42 PM	9	14	5:57 PM	0	0
2:13 PM	0	0	3:28 PM	0	0	4:43 PM	6	9	5:58 PM	0	0
2:14 PM	0	0	3:29 PM	4	6	4:44 PM	3	5	5:59 PM	0	0
2:15 PM	0	0	3:30 PM	3	5	4:45 PM	5	8	6:00 PM	1	2
2:16 PM	0	0	3:31 PM	5	8	4:46 PM	6	9	6:01 PM	8	13
2:17 PM	0	0	3:32 PM	3	5	4:47 PM	0	0	6:02 PM	6	9
2:18 PM	0	0	3:33 PM	9	14	4:48 PM	7	11	6:03 PM	8	13
2:19 PM	0	0	3:34 PM	5	8	4:49 PM	5	8	6:04 PM	9	14
2:20 PM	0	0	3:35 PM	6	9	4:50 PM	7	11	6:05 PM	6	9
2:21 PM	0	0	3:36 PM	5	8	4:51 PM	6	9	6:06 PM	11	17
2:22 PM	0	0	3:37 PM	0	0	4:52 PM	6	9	6:07 PM	2	3
2:23 PM	0	0	3:38 PM	3	5	4:53 PM	6	9	6:08 PM	3	5
2:24 PM	0	0	3:39 PM	1	2	4:54 PM	6	9	6:09 PM	5	8
2:25 PM	0	0	3:40 PM	7	11	4:55 PM	5	8	6:10 PM	16	25
2:26 PM	0	0	3:41 PM	5	8	4:56 PM	6	9	6:11 PM	4	6
2:27 PM	0	0	3:42 PM	2	3	4:57 PM	8	13	6:12 PM	0	0
2:28 PM	0	0	3:43 PM	4	6	4:58 PM	1	2	6:13 PM	4	6
2:29 PM	2	3	3:44 PM	0	0	4:59 PM	7	11	6:14 PM	6	9
2:30 PM	10	16	3:45 PM	18	28	5:00 PM	7	11	6:15 PM	0	0
2:31 PM	5	8	3:46 PM	7	11	5:01 PM	7	11	6:16 PM	2	3
2:32 PM	5	8	3:47 PM	0	0	5:02 PM	6	9	6:17 PM	6	9
2:33 PM	2	3	3:48 PM	4	6	5:03 PM	2	3	6:18 PM	6	9
2:34 PM	5	8	3:49 PM	4	6	5:04 PM	3	5	6:19 PM	8	13
2:35 PM	4	6	3:50 PM	5	8	5:05 PM	0	0	6:20 PM	4	6
2:36 PM	7	11	3:51 PM	6	9	5:06 PM	0	0	6:21 PM	1	2
2:37 PM	6	9	3:52 PM	7	11	5:07 PM	0	0	6:22 PM	2	3
2:38 PM	4	6	3:53 PM	4	6	5:08 PM	0	0	6:23 PM	3	5
2:39 PM	8	13	3:54 PM	2	3	5:09 PM	0	0	6:24 PM	7	11
2:40 PM	8	13	3:55 PM	6	9	5:10 PM	0	0	6:25 PM	4	6
2:41 PM	9	14	3:56 PM	1	2	5:11 PM	0	0	6:26 PM	6	9
2:42 PM	5	8	3:57 PM	4	6	5:12 PM	0	0	6:27 PM	5	8
2:43 PM	6	9	3:58 PM	5	8	5:13 PM	0	0	6:28 PM	1	2
2:44 PM	8	13	3:59 PM	4	6	5:14 PM	0	0	6:29 PM	0	0
2:45 PM	1	2	4:00 PM	5	8	5:15 PM	3	5	6:30 PM	0	0
2:46 PM	9	14	4:01 PM	6	9	5:16 PM	5	8	6:31 PM	0	0
2:47 PM	4	6	4:02 PM	3	5	5:17 PM	4	6	6:32 PM	0	0
2:48 PM	18	28	4:03 PM	6	9	5:18 PM	2	3	6:33 PM	0	0
2:49 PM	2	3	4:04 PM	7	11	5:19 PM	5	8	6:34 PM	0	0
2:50 PM	4	6	4:05 PM	4	6	5:20 PM	6	9	6:35 PM	1	2
2:51 PM	5	8	4:06 PM	2	3	5:21 PM	7	11	6:36 PM	4	6
2:52 PM	3	5	4:07 PM	0	0	5:22 PM	4	6	6:37 PM	5	8
2:53 PM	4	6	4:08 PM	0	0	5:23 PM	6	9	6:38 PM	4	6
2:54 PM	3	5	4:09 PM	0	0	5:24 PM	6	9	6:39 PM	7	11
2:55 PM	3	5	4:10 PM	0	0	5:25 PM	2	3	6:40 PM	9	14
2:56 PM	5	8	4:11 PM	0	0	5:26 PM	3	5	6:41 PM	6	9
2:57 PM	4	6	4:12 PM	1	2	5:27 PM	7	11	6:42 PM	3	5
2:58 PM	1	2	4:13 PM	0	0	5:28 PM	5	8	6:43 PM	3	5
2:59 PM	0	0	4:14 PM	0	0	5:29 PM	5	8	6:44 PM	17	27
3:00 PM	6	9	4:15 PM	2	3	5:30 PM	0	0	6:45 PM	0	0
3:01 PM	4	6	4:16 PM	3	5	5:31 PM	0	0	6:46 PM	1	2
3:02 PM	4	6	4:17 PM	5	8	5:32 PM	0	0	6:47 PM	0	0
3:03 PM	4	6	4:18 PM	4	6	5:33 PM	0	0	6:48 PM	6	9
3:04 PM	11	17	4:19 PM	4	6	5:34 PM	0	0	6:49 PM	0	0
3:05 PM	3	5	4:20 PM	5	8	5:35 PM	0	0	6:50 PM	0	0
3:06 PM	3	5	4:21 PM	5	8	5:36 PM	0	0	6:51 PM	0	0
3:07 PM	6	9	4:22 PM	3	5	5:37 PM	0	0	6:52 PM	0	0
3:08 PM	10	16	4:23 PM	1	2	5:38 PM	0	0	6:53 PM	0	0
3:09 PM	2	3	4:24 PM	4	6	5:39 PM	1	2	6:54 PM	0	0
3:10 PM	3	5	4:25 PM	5	8	5:40 PM	3	5	6:55 PM	0	0
3:11 PM	6	9	4:26 PM	6	9	5:41 PM	2	3	6:56 PM	1	2
3:12 PM	1	2	4:27 PM	5	8	5:42 PM	5	8	6:57 PM	2	3
3:13 PM	0	0	4:28 PM	8	13	5:43 PM	9	14	6:58 PM	0	0
3:14 PM	6	9	4:29 PM	5	8	5:44 PM	3	5	6:59 PM	0	0

# APPENDIX B: BOAT-WAIT METHODOLOGY

## Pt. Townsend-Keystone

Time	Adjusted Vehicles		Time	Adjusted Vehicles		Time	Adjusted Vehicles		Time	Adjusted Vehicles	
	Arriving, 2003	Arriving, 2030		Arriving, 2003	Arriving, 2030		Arriving, 2003	Arriving, 2030		Arriving, 2003	Arriving, 2030
2:00 PM	0	0	3:15 PM	0	0	4:30 PM	0	0	5:45 PM	0	0
2:01 PM	0	0	3:16 PM	0	0	4:31 PM	1	1	5:46 PM	0	0
2:02 PM	0	0	3:17 PM	0	0	4:32 PM	0	0	5:47 PM	0	0
2:03 PM	0	0	3:18 PM	0	0	4:33 PM	0	0	5:48 PM	2	3
2:04 PM	0	0	3:19 PM	0	0	4:34 PM	0	0	5:49 PM	0	0
2:05 PM	0	0	3:20 PM	0	0	4:35 PM	2	3	5:50 PM	0	0
2:06 PM	0	0	3:21 PM	0	0	4:36 PM	0	0	5:51 PM	0	0
2:07 PM	0	0	3:22 PM	1	1	4:37 PM	1	1	5:52 PM	1	1
2:08 PM	0	0	3:23 PM	2	3	4:38 PM	0	0	5:53 PM	0	0
2:09 PM	0	0	3:24 PM	1	1	4:39 PM	0	0	5:54 PM	0	0
2:10 PM	0	0	3:25 PM	1	1	4:40 PM	0	0	5:55 PM	0	0
2:11 PM	0	0	3:26 PM	0	0	4:41 PM	0	0	5:56 PM	2	3
2:12 PM	0	0	3:27 PM	0	0	4:42 PM	0	0	5:57 PM	4	5
2:13 PM	0	0	3:28 PM	1	1	4:43 PM	0	0	5:58 PM	0	0
2:14 PM	0	0	3:29 PM	1	1	4:44 PM	0	0	5:59 PM	0	0
2:15 PM	0	0	3:30 PM	1	1	4:45 PM	2	3	6:00 PM	1	1
2:16 PM	0	0	3:31 PM	0	0	4:46 PM	2	3	6:01 PM	3	4
2:17 PM	0	0	3:32 PM	0	0	4:47 PM	0	0	6:02 PM	1	1
2:18 PM	0	0	3:33 PM	1	1	4:48 PM	0	0	6:03 PM	0	0
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2:21 PM	0	0	3:36 PM	0	0	4:51 PM	2	3	6:06 PM	0	0
2:22 PM	0	0	3:37 PM	0	0	4:52 PM	2	3	6:07 PM	0	0
2:23 PM	0	0	3:38 PM	0	0	4:53 PM	0	0	6:08 PM	0	0
2:24 PM	0	0	3:39 PM	1	1	4:54 PM	0	0	6:09 PM	0	0
2:25 PM	0	0	3:40 PM	1	1	4:55 PM	0	0	6:10 PM	0	0
2:26 PM	0	0	3:41 PM	1	1	4:56 PM	0	0	6:11 PM	1	1
2:27 PM	2	3	3:42 PM	1	1	4:57 PM	0	0	6:12 PM	0	0
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2:29 PM	0	0	3:44 PM	1	1	4:59 PM	0	0	6:14 PM	0	0
2:30 PM	1	1	3:45 PM	2	3	5:00 PM	1	1	6:15 PM	0	0
2:31 PM	1	1	3:46 PM	0	0	5:01 PM	1	1	6:16 PM	0	0
2:32 PM	2	3	3:47 PM	3	4	5:02 PM	2	3	6:17 PM	0	0
2:33 PM	0	0	3:48 PM	1	1	5:03 PM	3	4	6:18 PM	0	0
2:34 PM	0	0	3:49 PM	1	1	5:04 PM	2	3	6:19 PM	3	4
2:35 PM	0	0	3:50 PM	0	0	5:05 PM	2	3	6:20 PM	2	3
2:36 PM	0	0	3:51 PM	0	0	5:06 PM	1	1	6:21 PM	0	0
2:37 PM	0	0	3:52 PM	1	1	5:07 PM	2	3	6:22 PM	0	0
2:38 PM	1	1	3:53 PM	1	1	5:08 PM	3	4	6:23 PM	0	0
2:39 PM	1	1	3:54 PM	1	1	5:09 PM	0	0	6:24 PM	0	0
2:40 PM	1	1	3:55 PM	3	4	5:10 PM	2	3	6:25 PM	0	0
2:41 PM	0	0	3:56 PM	0	0	5:11 PM	0	0	6:26 PM	0	0
2:42 PM	0	0	3:57 PM	0	0	5:12 PM	0	0	6:27 PM	3	4
2:43 PM	0	0	3:58 PM	1	1	5:13 PM	1	1	6:28 PM	1	1
2:44 PM	2	3	3:59 PM	0	0	5:14 PM	0	0	6:29 PM	0	0
2:45 PM	1	1	4:00 PM	0	0	5:15 PM	0	0	6:30 PM	1	1
2:46 PM	0	0	4:01 PM	0	0	5:16 PM	1	1	6:31 PM	0	0
2:47 PM	0	0	4:02 PM	1	1	5:17 PM	0	0	6:32 PM	0	0
2:48 PM	0	0	4:03 PM	0	0	5:18 PM	2	3	6:33 PM	0	0
2:49 PM	1	1	4:04 PM	1	1	5:19 PM	0	0	6:34 PM	1	1
2:50 PM	1	1	4:05 PM	0	0	5:20 PM	1	1	6:35 PM	1	1
2:51 PM	3	4	4:06 PM	1	1	5:21 PM	0	0	6:36 PM	2	3
2:52 PM	0	0	4:07 PM	0	0	5:22 PM	0	0	6:37 PM	1	1
2:53 PM	0	0	4:08 PM	0	0	5:23 PM	0	0	6:38 PM	1	1
2:54 PM	0	0	4:09 PM	0	0	5:24 PM	1	1	6:39 PM	0	0
2:55 PM	0	0	4:10 PM	2	3	5:25 PM	0	0	6:40 PM	0	0
2:56 PM	0	0	4:11 PM	3	4	5:26 PM	0	0	6:41 PM	0	0
2:57 PM	0	0	4:12 PM	1	1	5:27 PM	0	0	6:42 PM	1	1
2:58 PM	0	0	4:13 PM	0	0	5:28 PM	0	0	6:43 PM	0	0
2:59 PM	2	3	4:14 PM	0	0	5:29 PM	0	0	6:44 PM	0	0
3:00 PM	0	0	4:15 PM	0	0	5:30 PM	0	0	6:45 PM	0	0
3:01 PM	1	1	4:16 PM	0	0	5:31 PM	0	0	6:46 PM	1	1
3:02 PM	0	0	4:17 PM	1	1	5:32 PM	0	0	6:47 PM	0	0
3:03 PM	0	0	4:18 PM	0	0	5:33 PM	0	0	6:48 PM	0	0
3:04 PM	0	0	4:19 PM	1	1	5:34 PM	0	0	6:49 PM	0	0
3:05 PM	0	0	4:20 PM	0	0	5:35 PM	0	0	6:50 PM	0	0
3:06 PM	0	0	4:21 PM	1	1	5:36 PM	0	0	6:51 PM	1	1
3:07 PM	0	0	4:22 PM	0	0	5:37 PM	0	0	6:52 PM	1	1
3:08 PM	0	0	4:23 PM	0	0	5:38 PM	0	0	6:53 PM	0	0
3:09 PM	0	0	4:24 PM	0	0	5:39 PM	0	0	6:54 PM	0	0
3:10 PM	0	0	4:25 PM	0	0	5:40 PM	0	0	6:55 PM	1	1
3:11 PM	1	1	4:26 PM	0	0	5:41 PM	1	1	6:56 PM	0	0
3:12 PM	0	0	4:27 PM	0	0	5:42 PM	1	1	6:57 PM	0	0
3:13 PM	2	3	4:28 PM	1	1	5:43 PM	0	0	6:58 PM	0	0
3:14 PM	1	1	4:29 PM	0	0	5:44 PM	0	0	6:59 PM	0	0



# WASHINGTON STATE FERRIES

## Seattle-Bainbridge

Time	Adjusted Vehicles		Time	Adjusted Vehicles		Time	Adjusted Vehicles		Time	Adjusted Vehicles	
	Arriving, 2003	Arriving, 2030		Arriving, 2003	Arriving, 2030		Arriving, 2003	Arriving, 2030		Arriving, 2003	Arriving, 2030
2:00 PM	0	0	3:15 PM	5	8	4:30 PM	1	2	5:45 PM	0	0
2:01 PM	0	0	3:16 PM	3	5	4:31 PM	1	2	5:46 PM	3	5
2:02 PM	0	0	3:17 PM	8	13	4:32 PM	1	2	5:47 PM	2	3
2:03 PM	0	0	3:18 PM	6	10	4:33 PM	7	11	5:48 PM	5	8
2:04 PM	0	0	3:19 PM	3	5	4:34 PM	3	5	5:49 PM	3	5
2:05 PM	0	0	3:20 PM	8	13	4:35 PM	2	3	5:50 PM	0	0
2:06 PM	1	2	3:21 PM	4	6	4:36 PM	5	8	5:51 PM	3	5
2:07 PM	0	0	3:22 PM	4	6	4:37 PM	7	11	5:52 PM	1	2
2:08 PM	1	2	3:23 PM	6	10	4:38 PM	2	3	5:53 PM	4	6
2:09 PM	1	2	3:24 PM	7	11	4:39 PM	3	5	5:54 PM	2	3
2:10 PM	1	2	3:25 PM	3	5	4:40 PM	5	8	5:55 PM	3	5
2:11 PM	3	5	3:26 PM	5	8	4:41 PM	2	3	5:56 PM	2	3
2:12 PM	3	5	3:27 PM	9	14	4:42 PM	4	6	5:57 PM	2	3
2:13 PM	0	0	3:28 PM	4	6	4:43 PM	5	8	5:58 PM	1	2
2:14 PM	2	3	3:29 PM	6	10	4:44 PM	2	3	5:59 PM	0	0
2:15 PM	4	6	3:30 PM	7	11	4:45 PM	5	8	6:00 PM	1	2
2:16 PM	1	2	3:31 PM	8	13	4:46 PM	2	3	6:01 PM	4	6
2:17 PM	2	3	3:32 PM	5	8	4:47 PM	5	8	6:02 PM	4	6
2:18 PM	6	10	3:33 PM	2	3	4:48 PM	3	5	6:03 PM	4	6
2:19 PM	2	3	3:34 PM	1	2	4:49 PM	6	10	6:04 PM	6	10
2:20 PM	6	10	3:35 PM	2	3	4:50 PM	7	11	6:05 PM	2	3
2:21 PM	0	0	3:36 PM	3	5	4:51 PM	6	10	6:06 PM	2	3
2:22 PM	1	2	3:37 PM	7	11	4:52 PM	1	2	6:07 PM	1	2
2:23 PM	2	3	3:38 PM	5	8	4:53 PM	3	5	6:08 PM	2	3
2:24 PM	2	3	3:39 PM	3	5	4:54 PM	6	10	6:09 PM	2	3
2:25 PM	3	5	3:40 PM	3	5	4:55 PM	2	3	6:10 PM	6	10
2:26 PM	4	6	3:41 PM	2	3	4:56 PM	3	5	6:11 PM	6	10
2:27 PM	1	2	3:42 PM	5	8	4:57 PM	1	2	6:12 PM	0	0
2:28 PM	3	5	3:43 PM	2	3	4:58 PM	6	10	6:13 PM	4	6
2:29 PM	2	3	3:44 PM	2	3	4:59 PM	5	8	6:14 PM	2	3
2:30 PM	4	6	3:45 PM	1	2	5:00 PM	3	5	6:15 PM	4	6
2:31 PM	6	10	3:46 PM	7	11	5:01 PM	2	3	6:16 PM	3	5
2:32 PM	3	5	3:47 PM	8	13	5:02 PM	5	8	6:17 PM	1	2
2:33 PM	5	8	3:48 PM	1	2	5:03 PM	3	5	6:18 PM	2	3
2:34 PM	5	8	3:49 PM	4	6	5:04 PM	13	21	6:19 PM	2	3
2:35 PM	7	11	3:50 PM	19	30	5:05 PM	13	21	6:20 PM	0	0
2:36 PM	6	10	3:51 PM	13	21	5:06 PM	5	8	6:21 PM	0	0
2:37 PM	7	11	3:52 PM	0	0	5:07 PM	2	3	6:22 PM	0	0
2:38 PM	5	8	3:53 PM	2	3	5:08 PM	1	2	6:23 PM	0	0
2:39 PM	5	8	3:54 PM	6	10	5:09 PM	4	6	6:24 PM	0	0
2:40 PM	6	10	3:55 PM	3	5	5:10 PM	2	3	6:25 PM	0	0
2:41 PM	2	3	3:56 PM	6	10	5:11 PM	4	6	6:26 PM	0	0
2:42 PM	7	11	3:57 PM	3	5	5:12 PM	1	2	6:27 PM	0	0
2:43 PM	9	14	3:58 PM	2	3	5:13 PM	2	3	6:28 PM	0	0
2:44 PM	8	13	3:59 PM	2	3	5:14 PM	2	3	6:29 PM	0	0
2:45 PM	3	5	4:00 PM	6	10	5:15 PM	0	0	6:30 PM	0	0
2:46 PM	10	16	4:01 PM	2	3	5:16 PM	1	2	6:31 PM	0	0
2:47 PM	4	6	4:02 PM	1	2	5:17 PM	1	2	6:32 PM	0	0
2:48 PM	2	3	4:03 PM	1	2	5:18 PM	3	5	6:33 PM	0	0
2:49 PM	2	3	4:04 PM	5	8	5:19 PM	1	2	6:34 PM	0	0
2:50 PM	6	10	4:05 PM	3	5	5:20 PM	0	0	6:35 PM	0	0
2:51 PM	4	6	4:06 PM	6	10	5:21 PM	2	3	6:36 PM	0	0
2:52 PM	6	10	4:07 PM	2	3	5:22 PM	0	0	6:37 PM	0	0
2:53 PM	6	10	4:08 PM	4	6	5:23 PM	0	0	6:38 PM	0	0
2:54 PM	3	5	4:09 PM	1	2	5:24 PM	1	2	6:39 PM	0	0
2:55 PM	4	6	4:10 PM	5	8	5:25 PM	4	6	6:40 PM	0	0
2:56 PM	2	3	4:11 PM	2	3	5:26 PM	4	6	6:41 PM	0	0
2:57 PM	5	8	4:12 PM	5	8	5:27 PM	5	8	6:42 PM	0	0
2:58 PM	7	11	4:13 PM	5	8	5:28 PM	3	5	6:43 PM	0	0
2:59 PM	2	3	4:14 PM	4	6	5:29 PM	4	6	6:44 PM	0	0
3:00 PM	4	6	4:15 PM	3	5	5:30 PM	11	18	6:45 PM	0	0
3:01 PM	1	2	4:16 PM	8	13	5:31 PM	1	2	6:46 PM	0	0
3:02 PM	1	2	4:17 PM	2	3	5:32 PM	2	3	6:47 PM	0	0
3:03 PM	3	5	4:18 PM	2	3	5:33 PM	0	0	6:48 PM	0	0
3:04 PM	0	0	4:19 PM	1	2	5:34 PM	2	3	6:49 PM	0	0
3:05 PM	6	10	4:20 PM	1	2	5:35 PM	2	3	6:50 PM	0	0
3:06 PM	2	3	4:21 PM	3	5	5:36 PM	3	5	6:51 PM	0	0
3:07 PM	2	3	4:22 PM	3	5	5:37 PM	3	5	6:52 PM	0	0
3:08 PM	9	14	4:23 PM	2	3	5:38 PM	1	2	6:53 PM	0	0
3:09 PM	4	6	4:24 PM	5	8	5:39 PM	2	3	6:54 PM	0	0
3:10 PM	5	8	4:25 PM	4	6	5:40 PM	5	8	6:55 PM	0	0
3:11 PM	4	6	4:26 PM	1	2	5:41 PM	3	5	6:56 PM	0	0
3:12 PM	5	8	4:27 PM	6	10	5:42 PM	3	5	6:57 PM	0	0
3:13 PM	1	2	4:28 PM	1	2	5:43 PM	0	0	6:58 PM	0	0
3:14 PM	2	3	4:29 PM	1	2	5:44 PM	1	2	6:59 PM	0	0

# APPENDIX B: BOAT-WAIT METHODOLOGY

## Seattle-Bremerton

Time	Adjusted Vehicles Arriving		Time	Adjusted Vehicles Arriving		Time	Adjusted Vehicles Arriving		Time	Adjusted Vehicles Arriving	
	2003	2030		2003	2030		2003	2030		2003	2030
2:00 PM	0	0	3:15 PM	0	0	4:30 PM	0	0	5:45 PM	3	11
2:01 PM	0	0	3:16 PM	1	4	4:31 PM	1	4	5:46 PM	0	0
2:02 PM	0	0	3:17 PM	2	8	4:32 PM	1	4	5:47 PM	0	0
2:03 PM	0	0	3:18 PM	4	15	4:33 PM	6	23	5:48 PM	0	0
2:04 PM	0	0	3:19 PM	3	11	4:34 PM	0	0	5:49 PM	2	8
2:05 PM	0	0	3:20 PM	3	11	4:35 PM	7	27	5:50 PM	1	4
2:06 PM	0	0	3:21 PM	3	11	4:36 PM	5	19	5:51 PM	0	0
2:07 PM	0	0	3:22 PM	3	11	4:37 PM	1	4	5:52 PM	2	8
2:08 PM	0	0	3:23 PM	4	15	4:38 PM	5	19	5:53 PM	1	4
2:09 PM	0	0	3:24 PM	2	8	4:39 PM	3	11	5:54 PM	1	4
2:10 PM	0	0	3:25 PM	4	15	4:40 PM	4	15	5:55 PM	2	8
2:11 PM	0	0	3:26 PM	2	8	4:41 PM	5	19	5:56 PM	0	0
2:12 PM	0	0	3:27 PM	3	11	4:42 PM	2	8	5:57 PM	1	4
2:13 PM	0	0	3:28 PM	2	8	4:43 PM	2	8	5:58 PM	3	11
2:14 PM	0	0	3:29 PM	6	23	4:44 PM	3	11	5:59 PM	3	11
2:15 PM	0	0	3:30 PM	5	19	4:45 PM	3	11	6:00 PM	0	0
2:16 PM	0	0	3:31 PM	4	15	4:46 PM	4	15	6:01 PM	0	0
2:17 PM	0	0	3:32 PM	4	15	4:47 PM	3	11	6:02 PM	1	4
2:18 PM	1	4	3:33 PM	2	8	4:48 PM	2	8	6:03 PM	2	8
2:19 PM	0	0	3:34 PM	1	4	4:49 PM	2	8	6:04 PM	2	8
2:20 PM	0	0	3:35 PM	4	15	4:50 PM	3	11	6:05 PM	1	4
2:21 PM	0	0	3:36 PM	4	15	4:51 PM	3	11	6:06 PM	1	4
2:22 PM	0	0	3:37 PM	2	8	4:52 PM	3	11	6:07 PM	1	4
2:23 PM	0	0	3:38 PM	6	23	4:53 PM	2	8	6:08 PM	1	4
2:24 PM	0	0	3:39 PM	3	11	4:54 PM	0	0	6:09 PM	2	8
2:25 PM	1	4	3:40 PM	5	19	4:55 PM	1	4	6:10 PM	2	8
2:26 PM	0	0	3:41 PM	6	23	4:56 PM	1	4	6:11 PM	0	0
2:27 PM	1	4	3:42 PM	3	11	4:57 PM	3	11	6:12 PM	2	8
2:28 PM	1	4	3:43 PM	0	0	4:58 PM	2	8	6:13 PM	1	4
2:29 PM	0	0	3:44 PM	0	0	4:59 PM	0	0	6:14 PM	4	15
2:30 PM	0	0	3:45 PM	2	8	5:00 PM	2	8	6:15 PM	0	0
2:31 PM	0	0	3:46 PM	0	0	5:01 PM	1	4	6:16 PM	1	4
2:32 PM	0	0	3:47 PM	1	4	5:02 PM	3	11	6:17 PM	2	8
2:33 PM	0	0	3:48 PM	1	4	5:03 PM	1	4	6:18 PM	1	4
2:34 PM	0	0	3:49 PM	3	11	5:04 PM	1	4	6:19 PM	2	8
2:35 PM	0	0	3:50 PM	0	0	5:05 PM	2	8	6:20 PM	1	4
2:36 PM	0	0	3:51 PM	0	0	5:06 PM	0	0	6:21 PM	3	11
2:37 PM	0	0	3:52 PM	0	0	5:07 PM	1	4	6:22 PM	0	0
2:38 PM	0	0	3:53 PM	0	0	5:08 PM	1	4	6:23 PM	1	4
2:39 PM	0	0	3:54 PM	0	0	5:09 PM	0	0	6:24 PM	3	11
2:40 PM	0	0	3:55 PM	0	0	5:10 PM	2	8	6:25 PM	1	4
2:41 PM	0	0	3:56 PM	1	4	5:11 PM	2	8	6:26 PM	3	11
2:42 PM	0	0	3:57 PM	3	11	5:12 PM	0	0	6:27 PM	0	0
2:43 PM	0	0	3:58 PM	0	0	5:13 PM	0	0	6:28 PM	0	0
2:44 PM	0	0	3:59 PM	0	0	5:14 PM	0	0	6:29 PM	0	0
2:45 PM	0	0	4:00 PM	0	0	5:15 PM	0	0	6:30 PM	0	0
2:46 PM	1	4	4:01 PM	0	0	5:16 PM	1	4	6:31 PM	0	0
2:47 PM	0	0	4:02 PM	0	0	5:17 PM	1	4	6:32 PM	0	0
2:48 PM	1	4	4:03 PM	1	4	5:18 PM	0	0	6:33 PM	0	0
2:49 PM	1	4	4:04 PM	0	0	5:19 PM	0	0	6:34 PM	0	0
2:50 PM	0	0	4:05 PM	2	8	5:20 PM	0	0	6:35 PM	0	0
2:51 PM	0	0	4:06 PM	2	8	5:21 PM	0	0	6:36 PM	0	0
2:52 PM	0	0	4:07 PM	0	0	5:22 PM	1	4	6:37 PM	0	0
2:53 PM	0	0	4:08 PM	1	4	5:23 PM	1	4	6:38 PM	0	0
2:54 PM	2	8	4:09 PM	1	4	5:24 PM	0	0	6:39 PM	0	0
2:55 PM	0	0	4:10 PM	0	0	5:25 PM	1	4	6:40 PM	0	0
2:56 PM	1	4	4:11 PM	1	4	5:26 PM	0	0	6:41 PM	0	0
2:57 PM	0	0	4:12 PM	1	4	5:27 PM	0	0	6:42 PM	0	0
2:58 PM	1	4	4:13 PM	0	0	5:28 PM	0	0	6:43 PM	0	0
2:59 PM	2	8	4:14 PM	4	15	5:29 PM	0	0	6:44 PM	0	0
3:00 PM	2	8	4:15 PM	0	0	5:30 PM	1	4	6:45 PM	0	0
3:01 PM	0	0	4:16 PM	0	0	5:31 PM	1	4	6:46 PM	0	0
3:02 PM	2	8	4:17 PM	0	0	5:32 PM	1	4	6:47 PM	0	0
3:03 PM	1	4	4:18 PM	1	4	5:33 PM	1	4	6:48 PM	0	0
3:04 PM	3	11	4:19 PM	0	0	5:34 PM	2	8	6:49 PM	0	0
3:05 PM	1	4	4:20 PM	4	15	5:35 PM	0	0	6:50 PM	0	0
3:06 PM	1	4	4:21 PM	1	4	5:36 PM	0	0	6:51 PM	0	0
3:07 PM	2	8	4:22 PM	3	11	5:37 PM	0	0	6:52 PM	0	0
3:08 PM	4	15	4:23 PM	2	8	5:38 PM	0	0	6:53 PM	0	0
3:09 PM	0	0	4:24 PM	1	4	5:39 PM	0	0	6:54 PM	0	0
3:10 PM	2	8	4:25 PM	0	0	5:40 PM	0	0	6:55 PM	0	0
3:11 PM	3	11	4:26 PM	4	15	5:41 PM	1	4	6:56 PM	0	0
3:12 PM	3	11	4:27 PM	2	8	5:42 PM	0	0	6:57 PM	0	0
3:13 PM	2	8	4:28 PM	1	4	5:43 PM	3	11	6:58 PM	0	0
3:14 PM	3	11	4:29 PM	1	4	5:44 PM	0	0	6:59 PM	0	0



# WASHINGTON STATE FERRIES

## Fauntleroy/Seattle-Southworth

Time	Adjusted Vehicles		Time	Adjusted Vehicles		Time	Adjusted Vehicles		Time	Adjusted Vehicles	
	Arriving, 2003	Arriving, 2030		Arriving, 2003	Arriving, 2030		Arriving, 2003	Arriving, 2030		Arriving, 2003	Arriving, 2030
2:00 PM	0	0	3:15 PM	0	0	4:30 PM	2	7	5:45 PM	1	3
2:01 PM	0	0	3:16 PM	1	3	4:31 PM	2	7	5:46 PM	0	0
2:02 PM	0	0	3:17 PM	2	7	4:32 PM	0	0	5:47 PM	1	3
2:03 PM	0	0	3:18 PM	1	3	4:33 PM	1	3	5:48 PM	0	0
2:04 PM	0	0	3:19 PM	2	7	4:34 PM	1	3	5:49 PM	0	0
2:05 PM	0	0	3:20 PM	0	0	4:35 PM	0	0	5:50 PM	1	3
2:06 PM	0	0	3:21 PM	2	7	4:36 PM	0	0	5:51 PM	0	0
2:07 PM	0	0	3:22 PM	0	0	4:37 PM	0	0	5:52 PM	2	7
2:08 PM	0	0	3:23 PM	0	0	4:38 PM	0	0	5:53 PM	3	10
2:09 PM	0	0	3:24 PM	1	3	4:39 PM	1	3	5:54 PM	2	7
2:10 PM	0	0	3:25 PM	0	0	4:40 PM	2	7	5:55 PM	0	0
2:11 PM	0	0	3:26 PM	2	7	4:41 PM	1	3	5:56 PM	1	3
2:12 PM	0	0	3:27 PM	1	3	4:42 PM	1	3	5:57 PM	0	0
2:13 PM	0	0	3:28 PM	1	3	4:43 PM	2	7	5:58 PM	0	0
2:14 PM	0	0	3:29 PM	0	0	4:44 PM	4	13	5:59 PM	2	7
2:15 PM	0	0	3:30 PM	1	3	4:45 PM	0	0	6:00 PM	0	0
2:16 PM	0	0	3:31 PM	2	7	4:46 PM	1	3	6:01 PM	2	7
2:17 PM	0	0	3:32 PM	2	7	4:47 PM	1	3	6:02 PM	0	0
2:18 PM	0	0	3:33 PM	2	7	4:48 PM	1	3	6:03 PM	3	10
2:19 PM	0	0	3:34 PM	2	7	4:49 PM	0	0	6:04 PM	2	7
2:20 PM	0	0	3:35 PM	2	7	4:50 PM	1	3	6:05 PM	0	0
2:21 PM	0	0	3:36 PM	0	0	4:51 PM	1	3	6:06 PM	1	3
2:22 PM	0	0	3:37 PM	1	3	4:52 PM	2	7	6:07 PM	2	7
2:23 PM	0	0	3:38 PM	2	7	4:53 PM	1	3	6:08 PM	0	0
2:24 PM	0	0	3:39 PM	1	3	4:54 PM	1	3	6:09 PM	0	0
2:25 PM	0	0	3:40 PM	4	13	4:55 PM	0	0	6:10 PM	1	3
2:26 PM	0	0	3:41 PM	0	0	4:56 PM	1	3	6:11 PM	0	0
2:27 PM	0	0	3:42 PM	0	0	4:57 PM	2	7	6:12 PM	1	3
2:28 PM	0	0	3:43 PM	1	3	4:58 PM	2	7	6:13 PM	1	3
2:29 PM	0	0	3:44 PM	2	7	4:59 PM	3	10	6:14 PM	2	7
2:30 PM	0	0	3:45 PM	1	3	5:00 PM	2	7	6:15 PM	0	0
2:31 PM	0	0	3:46 PM	2	7	5:01 PM	1	3	6:16 PM	2	7
2:32 PM	0	0	3:47 PM	0	0	5:02 PM	1	3	6:17 PM	0	0
2:33 PM	0	0	3:48 PM	2	7	5:03 PM	0	0	6:18 PM	1	3
2:34 PM	0	0	3:49 PM	3	10	5:04 PM	0	0	6:19 PM	0	0
2:35 PM	0	0	3:50 PM	2	7	5:05 PM	2	7	6:20 PM	0	0
2:36 PM	0	0	3:51 PM	1	3	5:06 PM	1	3	6:21 PM	0	0
2:37 PM	0	0	3:52 PM	1	3	5:07 PM	0	0	6:22 PM	0	0
2:38 PM	0	0	3:53 PM	5	17	5:08 PM	2	7	6:23 PM	1	3
2:39 PM	0	0	3:54 PM	1	3	5:09 PM	0	0	6:24 PM	1	3
2:40 PM	0	0	3:55 PM	1	3	5:10 PM	2	7	6:25 PM	0	0
2:41 PM	0	0	3:56 PM	0	0	5:11 PM	0	0	6:26 PM	1	3
2:42 PM	0	0	3:57 PM	2	7	5:12 PM	0	0	6:27 PM	1	3
2:43 PM	0	0	3:58 PM	3	10	5:13 PM	1	3	6:28 PM	0	0
2:44 PM	0	0	3:59 PM	2	7	5:14 PM	3	10	6:29 PM	0	0
2:45 PM	0	0	4:00 PM	0	0	5:15 PM	1	3	6:30 PM	0	0
2:46 PM	0	0	4:01 PM	2	7	5:16 PM	1	3	6:31 PM	2	7
2:47 PM	0	0	4:02 PM	0	0	5:17 PM	1	3	6:32 PM	1	3
2:48 PM	2	7	4:03 PM	1	3	5:18 PM	2	7	6:33 PM	0	0
2:49 PM	2	7	4:04 PM	0	0	5:19 PM	0	0	6:34 PM	1	3
2:50 PM	2	7	4:05 PM	1	3	5:20 PM	1	3	6:35 PM	0	0
2:51 PM	0	0	4:06 PM	0	0	5:21 PM	0	0	6:36 PM	0	0
2:52 PM	2	7	4:07 PM	0	0	5:22 PM	2	7	6:37 PM	0	0
2:53 PM	1	3	4:08 PM	2	7	5:23 PM	2	7	6:38 PM	1	3
2:54 PM	1	3	4:09 PM	0	0	5:24 PM	1	3	6:39 PM	1	3
2:55 PM	1	3	4:10 PM	0	0	5:25 PM	0	0	6:40 PM	0	0
2:56 PM	1	3	4:11 PM	1	3	5:26 PM	1	3	6:41 PM	2	7
2:57 PM	2	7	4:12 PM	1	3	5:27 PM	2	7	6:42 PM	0	0
2:58 PM	1	3	4:13 PM	3	10	5:28 PM	2	7	6:43 PM	2	7
2:59 PM	0	0	4:14 PM	3	10	5:29 PM	1	3	6:44 PM	1	3
3:00 PM	1	3	4:15 PM	1	3	5:30 PM	0	0	6:45 PM	1	3
3:01 PM	2	7	4:16 PM	1	3	5:31 PM	0	0	6:46 PM	0	0
3:02 PM	0	0	4:17 PM	1	3	5:32 PM	1	3	6:47 PM	1	3
3:03 PM	1	3	4:18 PM	0	0	5:33 PM	0	0	6:48 PM	4	13
3:04 PM	3	10	4:19 PM	0	0	5:34 PM	3	10	6:49 PM	2	7
3:05 PM	0	0	4:20 PM	0	0	5:35 PM	0	0	6:50 PM	0	0
3:06 PM	0	0	4:21 PM	2	7	5:36 PM	0	0	6:51 PM	0	0
3:07 PM	1	3	4:22 PM	1	3	5:37 PM	2	7	6:52 PM	0	0
3:08 PM	1	3	4:23 PM	2	7	5:38 PM	0	0	6:53 PM	1	3
3:09 PM	1	3	4:24 PM	1	3	5:39 PM	0	0	6:54 PM	1	3
3:10 PM	4	13	4:25 PM	1	3	5:40 PM	0	0	6:55 PM	1	3
3:11 PM	0	0	4:26 PM	2	7	5:41 PM	0	0	6:56 PM	1	3
3:12 PM	0	0	4:27 PM	0	0	5:42 PM	1	3	6:57 PM	0	0
3:13 PM	0	0	4:28 PM	0	0	5:43 PM	3	10	6:58 PM	0	0
3:14 PM	0	0	4:29 PM	2	7	5:44 PM	2	7	6:59 PM	0	0

# APPENDIX B: BOAT-WAIT METHODOLOGY

## Fautleroy-Vashon

Time	Adjusted Vehicles		Time	Adjusted Vehicles		Time	Adjusted Vehicles		Time	Adjusted Vehicles	
	Arriving, 2003	Arriving, 2030		Arriving, 2003	Arriving, 2030		Arriving, 2003	Arriving, 2030		Arriving, 2003	Arriving, 2030
2:00 PM	0	0	3:15 PM	1	2	4:30 PM	2	3	5:45 PM	4	6
2:01 PM	0	0	3:16 PM	2	3	4:31 PM	3	5	5:46 PM	11	18
2:02 PM	0	0	3:17 PM	6	10	4:32 PM	1	2	5:47 PM	1	2
2:03 PM	0	0	3:18 PM	4	6	4:33 PM	2	3	5:48 PM	0	0
2:04 PM	0	0	3:19 PM	3	5	4:34 PM	5	8	5:49 PM	2	3
2:05 PM	0	0	3:20 PM	0	0	4:35 PM	2	3	5:50 PM	2	3
2:06 PM	0	0	3:21 PM	1	2	4:36 PM	1	2	5:51 PM	1	2
2:07 PM	0	0	3:22 PM	0	0	4:37 PM	0	0	5:52 PM	3	5
2:08 PM	0	0	3:23 PM	2	3	4:38 PM	0	0	5:53 PM	0	0
2:09 PM	0	0	3:24 PM	2	3	4:39 PM	4	6	5:54 PM	0	0
2:10 PM	0	0	3:25 PM	0	0	4:40 PM	3	5	5:55 PM	3	5
2:11 PM	0	0	3:26 PM	3	5	4:41 PM	4	6	5:56 PM	0	0
2:12 PM	0	0	3:27 PM	1	2	4:42 PM	3	5	5:57 PM	0	0
2:13 PM	0	0	3:28 PM	2	3	4:43 PM	6	10	5:58 PM	1	2
2:14 PM	0	0	3:29 PM	0	0	4:44 PM	4	6	5:59 PM	6	10
2:15 PM	0	0	3:30 PM	3	5	4:45 PM	4	6	6:00 PM	5	8
2:16 PM	0	0	3:31 PM	2	3	4:46 PM	3	5	6:01 PM	1	2
2:17 PM	0	0	3:32 PM	2	3	4:47 PM	2	3	6:02 PM	0	0
2:18 PM	0	0	3:33 PM	3	5	4:48 PM	0	0	6:03 PM	6	10
2:19 PM	0	0	3:34 PM	2	3	4:49 PM	0	0	6:04 PM	1	2
2:20 PM	0	0	3:35 PM	2	3	4:50 PM	2	3	6:05 PM	2	3
2:21 PM	0	0	3:36 PM	1	2	4:51 PM	2	3	6:06 PM	2	3
2:22 PM	0	0	3:37 PM	3	5	4:52 PM	3	5	6:07 PM	3	5
2:23 PM	0	0	3:38 PM	1	2	4:53 PM	1	2	6:08 PM	2	3
2:24 PM	0	0	3:39 PM	1	2	4:54 PM	3	5	6:09 PM	0	0
2:25 PM	0	0	3:40 PM	2	3	4:55 PM	2	3	6:10 PM	1	2
2:26 PM	0	0	3:41 PM	2	3	4:56 PM	3	5	6:11 PM	1	2
2:27 PM	0	0	3:42 PM	0	0	4:57 PM	2	3	6:12 PM	1	2
2:28 PM	0	0	3:43 PM	2	3	4:58 PM	2	3	6:13 PM	7	11
2:29 PM	0	0	3:44 PM	1	2	4:59 PM	0	0	6:14 PM	3	5
2:30 PM	0	0	3:45 PM	4	6	5:00 PM	3	5	6:15 PM	0	0
2:31 PM	0	0	3:46 PM	1	2	5:01 PM	5	8	6:16 PM	4	6
2:32 PM	0	0	3:47 PM	2	3	5:02 PM	4	6	6:17 PM	0	0
2:33 PM	0	0	3:48 PM	3	5	5:03 PM	3	5	6:18 PM	5	8
2:34 PM	0	0	3:49 PM	4	6	5:04 PM	1	2	6:19 PM	2	3
2:35 PM	0	0	3:50 PM	0	0	5:05 PM	4	6	6:20 PM	1	2
2:36 PM	1	2	3:51 PM	4	6	5:06 PM	0	0	6:21 PM	0	0
2:37 PM	0	0	3:52 PM	1	2	5:07 PM	9	14	6:22 PM	1	2
2:38 PM	1	2	3:53 PM	3	5	5:08 PM	1	2	6:23 PM	1	2
2:39 PM	0	0	3:54 PM	2	3	5:09 PM	1	2	6:24 PM	2	3
2:40 PM	3	5	3:55 PM	3	5	5:10 PM	7	11	6:25 PM	2	3
2:41 PM	4	6	3:56 PM	6	10	5:11 PM	4	6	6:26 PM	3	5
2:42 PM	4	6	3:57 PM	1	2	5:12 PM	3	5	6:27 PM	5	8
2:43 PM	4	6	3:58 PM	2	3	5:13 PM	0	0	6:28 PM	4	6
2:44 PM	2	3	3:59 PM	1	2	5:14 PM	2	3	6:29 PM	2	3
2:45 PM	4	6	4:00 PM	0	0	5:15 PM	3	5	6:30 PM	2	3
2:46 PM	2	3	4:01 PM	4	6	5:16 PM	4	6	6:31 PM	2	3
2:47 PM	3	5	4:02 PM	3	5	5:17 PM	3	5	6:32 PM	1	2
2:48 PM	3	5	4:03 PM	0	0	5:18 PM	3	5	6:33 PM	4	6
2:49 PM	5	8	4:04 PM	0	0	5:19 PM	2	3	6:34 PM	2	3
2:50 PM	1	2	4:05 PM	0	0	5:20 PM	0	0	6:35 PM	5	8
2:51 PM	1	2	4:06 PM	0	0	5:21 PM	1	2	6:36 PM	8	13
2:52 PM	2	3	4:07 PM	0	0	5:22 PM	1	2	6:37 PM	1	2
2:53 PM	4	6	4:08 PM	0	0	5:23 PM	0	0	6:38 PM	4	6
2:54 PM	2	3	4:09 PM	0	0	5:24 PM	3	5	6:39 PM	4	6
2:55 PM	3	5	4:10 PM	0	0	5:25 PM	3	5	6:40 PM	4	6
2:56 PM	1	2	4:11 PM	0	0	5:26 PM	3	5	6:41 PM	2	3
2:57 PM	3	5	4:12 PM	3	5	5:27 PM	2	3	6:42 PM	5	8
2:58 PM	1	2	4:13 PM	6	10	5:28 PM	1	2	6:43 PM	2	3
2:59 PM	1	2	4:14 PM	10	16	5:29 PM	3	5	6:44 PM	1	2
3:00 PM	4	6	4:15 PM	6	10	5:30 PM	4	6	6:45 PM	4	6
3:01 PM	0	0	4:16 PM	5	8	5:31 PM	2	3	6:46 PM	2	3
3:02 PM	2	3	4:17 PM	1	2	5:32 PM	2	3	6:47 PM	1	2
3:03 PM	0	0	4:18 PM	0	0	5:33 PM	4	6	6:48 PM	7	11
3:04 PM	2	3	4:19 PM	3	5	5:34 PM	2	3	6:49 PM	0	0
3:05 PM	2	3	4:20 PM	3	5	5:35 PM	1	2	6:50 PM	0	0
3:06 PM	2	3	4:21 PM	5	8	5:36 PM	1	2	6:51 PM	0	0
3:07 PM	2	3	4:22 PM	4	6	5:37 PM	1	2	6:52 PM	1	2
3:08 PM	2	3	4:23 PM	4	6	5:38 PM	0	0	6:53 PM	4	6
3:09 PM	4	6	4:24 PM	9	14	5:39 PM	0	0	6:54 PM	3	5
3:10 PM	4	6	4:25 PM	7	11	5:40 PM	1	2	6:55 PM	2	3
3:11 PM	1	2	4:26 PM	4	6	5:41 PM	0	0	6:56 PM	3	5
3:12 PM	0	0	4:27 PM	3	5	5:42 PM	2	3	6:57 PM	0	0
3:13 PM	1	2	4:28 PM	2	3	5:43 PM	6	10	6:58 PM	2	3
3:14 PM	3	5	4:29 PM	0	0	5:44 PM	4	6	6:59 PM	0	0



# WASHINGTON STATE FERRIES

## Pt. Defiance-Tahlequah

Time	Adjusted Vehicles Arriving		Time	Adjusted Vehicles Arriving		Time	Adjusted Vehicles Arriving		Time	Adjusted Vehicles Arriving	
	2003	2030		2003	2030		2003	2030		2003	2030
2:00 PM	0	0	3:15 PM	0	0	4:30 PM	0	0	5:45 PM	1	1
2:01 PM	0	0	3:16 PM	2	2	4:31 PM	2	2	5:46 PM	1	1
2:02 PM	0	0	3:17 PM	1	1	4:32 PM	0	0	5:47 PM	3	4
2:03 PM	0	0	3:18 PM	2	2	4:33 PM	1	1	5:48 PM	1	1
2:04 PM	0	0	3:19 PM	1	1	4:34 PM	0	0	5:49 PM	1	1
2:05 PM	0	0	3:20 PM	4	5	4:35 PM	1	1	5:50 PM	1	1
2:06 PM	0	0	3:21 PM	2	2	4:36 PM	2	2	5:51 PM	2	2
2:07 PM	0	0	3:22 PM	5	6	4:37 PM	2	2	5:52 PM	0	0
2:08 PM	0	0	3:23 PM	0	0	4:38 PM	0	0	5:53 PM	1	1
2:09 PM	0	0	3:24 PM	3	4	4:39 PM	0	0	5:54 PM	1	1
2:10 PM	0	0	3:25 PM	1	1	4:40 PM	2	2	5:55 PM	2	2
2:11 PM	0	0	3:26 PM	0	0	4:41 PM	1	1	5:56 PM	4	5
2:12 PM	0	0	3:27 PM	0	0	4:42 PM	1	1	5:57 PM	4	5
2:13 PM	0	0	3:28 PM	1	1	4:43 PM	0	0	5:58 PM	0	0
2:14 PM	0	0	3:29 PM	3	4	4:44 PM	1	1	5:59 PM	0	0
2:15 PM	0	0	3:30 PM	0	0	4:45 PM	0	0	6:00 PM	0	0
2:16 PM	0	0	3:31 PM	0	0	4:46 PM	0	0	6:01 PM	0	0
2:17 PM	0	0	3:32 PM	0	0	4:47 PM	2	2	6:02 PM	0	0
2:18 PM	0	0	3:33 PM	1	1	4:48 PM	0	0	6:03 PM	0	0
2:19 PM	0	0	3:34 PM	2	2	4:49 PM	1	1	6:04 PM	0	0
2:20 PM	0	0	3:35 PM	0	0	4:50 PM	2	2	6:05 PM	3	4
2:21 PM	0	0	3:36 PM	0	0	4:51 PM	1	1	6:06 PM	2	2
2:22 PM	0	0	3:37 PM	1	1	4:52 PM	1	1	6:07 PM	1	1
2:23 PM	0	0	3:38 PM	0	0	4:53 PM	0	0	6:08 PM	2	2
2:24 PM	0	0	3:39 PM	0	0	4:54 PM	1	1	6:09 PM	1	1
2:25 PM	0	0	3:40 PM	1	1	4:55 PM	0	0	6:10 PM	1	1
2:26 PM	0	0	3:41 PM	0	0	4:56 PM	0	0	6:11 PM	2	2
2:27 PM	0	0	3:42 PM	0	0	4:57 PM	1	1	6:12 PM	1	1
2:28 PM	0	0	3:43 PM	0	0	4:58 PM	0	0	6:13 PM	2	2
2:29 PM	0	0	3:44 PM	1	1	4:59 PM	3	4	6:14 PM	2	2
2:30 PM	0	0	3:45 PM	0	0	5:00 PM	2	2	6:15 PM	2	2
2:31 PM	0	0	3:46 PM	0	0	5:01 PM	2	2	6:16 PM	0	0
2:32 PM	0	0	3:47 PM	0	0	5:02 PM	0	0	6:17 PM	0	0
2:33 PM	0	0	3:48 PM	2	2	5:03 PM	0	0	6:18 PM	0	0
2:34 PM	0	0	3:49 PM	0	0	5:04 PM	2	2	6:19 PM	0	0
2:35 PM	0	0	3:50 PM	0	0	5:05 PM	1	1	6:20 PM	1	1
2:36 PM	0	0	3:51 PM	0	0	5:06 PM	2	2	6:21 PM	1	1
2:37 PM	0	0	3:52 PM	0	0	5:07 PM	1	1	6:22 PM	1	1
2:38 PM	0	0	3:53 PM	0	0	5:08 PM	1	1	6:23 PM	1	1
2:39 PM	0	0	3:54 PM	2	2	5:09 PM	1	1	6:24 PM	0	0
2:40 PM	0	0	3:55 PM	0	0	5:10 PM	0	0	6:25 PM	0	0
2:41 PM	0	0	3:56 PM	1	1	5:11 PM	4	5	6:26 PM	0	0
2:42 PM	0	0	3:57 PM	2	2	5:12 PM	2	2	6:27 PM	0	0
2:43 PM	0	0	3:58 PM	2	2	5:13 PM	1	1	6:28 PM	0	0
2:44 PM	0	0	3:59 PM	1	1	5:14 PM	0	0	6:29 PM	0	0
2:45 PM	0	0	4:00 PM	0	0	5:15 PM	2	2	6:30 PM	0	0
2:46 PM	0	0	4:01 PM	1	1	5:16 PM	1	1	6:31 PM	0	0
2:47 PM	0	0	4:02 PM	4	5	5:17 PM	3	4	6:32 PM	0	0
2:48 PM	0	0	4:03 PM	2	2	5:18 PM	3	4	6:33 PM	0	0
2:49 PM	0	0	4:04 PM	5	6	5:19 PM	1	1	6:34 PM	0	0
2:50 PM	0	0	4:05 PM	0	0	5:20 PM	1	1	6:35 PM	0	0
2:51 PM	4	5	4:06 PM	3	4	5:21 PM	0	0	6:36 PM	0	0
2:52 PM	5	6	4:07 PM	2	2	5:22 PM	0	0	6:37 PM	0	0
2:53 PM	3	4	4:08 PM	3	4	5:23 PM	1	1	6:38 PM	0	0
2:54 PM	2	2	4:09 PM	2	2	5:24 PM	1	1	6:39 PM	0	0
2:55 PM	0	0	4:10 PM	2	2	5:25 PM	0	0	6:40 PM	0	0
2:56 PM	0	0	4:11 PM	1	1	5:26 PM	0	0	6:41 PM	0	0
2:57 PM	1	1	4:12 PM	4	5	5:27 PM	0	0	6:42 PM	0	0
2:58 PM	3	4	4:13 PM	2	2	5:28 PM	1	1	6:43 PM	0	0
2:59 PM	1	1	4:14 PM	0	0	5:29 PM	0	0	6:44 PM	0	0
3:00 PM	1	1	4:15 PM	1	1	5:30 PM	0	0	6:45 PM	0	0
3:01 PM	1	1	4:16 PM	0	0	5:31 PM	1	1	6:46 PM	0	0
3:02 PM	1	1	4:17 PM	1	1	5:32 PM	3	4	6:47 PM	0	0
3:03 PM	0	0	4:18 PM	2	2	5:33 PM	0	0	6:48 PM	0	0
3:04 PM	0	0	4:19 PM	1	1	5:34 PM	0	0	6:49 PM	0	0
3:05 PM	1	1	4:20 PM	1	1	5:35 PM	0	0	6:50 PM	0	0
3:06 PM	1	1	4:21 PM	2	2	5:36 PM	0	0	6:51 PM	0	0
3:07 PM	2	2	4:22 PM	1	1	5:37 PM	2	2	6:52 PM	0	0
3:08 PM	1	1	4:23 PM	0	0	5:38 PM	0	0	6:53 PM	0	0
3:09 PM	4	5	4:24 PM	0	0	5:39 PM	0	0	6:54 PM	0	0
3:10 PM	2	2	4:25 PM	2	2	5:40 PM	0	0	6:55 PM	0	0
3:11 PM	0	0	4:26 PM	2	2	5:41 PM	1	1	6:56 PM	0	0
3:12 PM	4	5	4:27 PM	0	0	5:42 PM	0	0	6:57 PM	0	0
3:13 PM	0	0	4:28 PM	1	1	5:43 PM	0	0	6:58 PM	0	0
3:14 PM	4	5	4:29 PM	0	0	5:44 PM	2	2	6:59 PM	0	0