

Appendix A - Vessel Routes

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Methodology

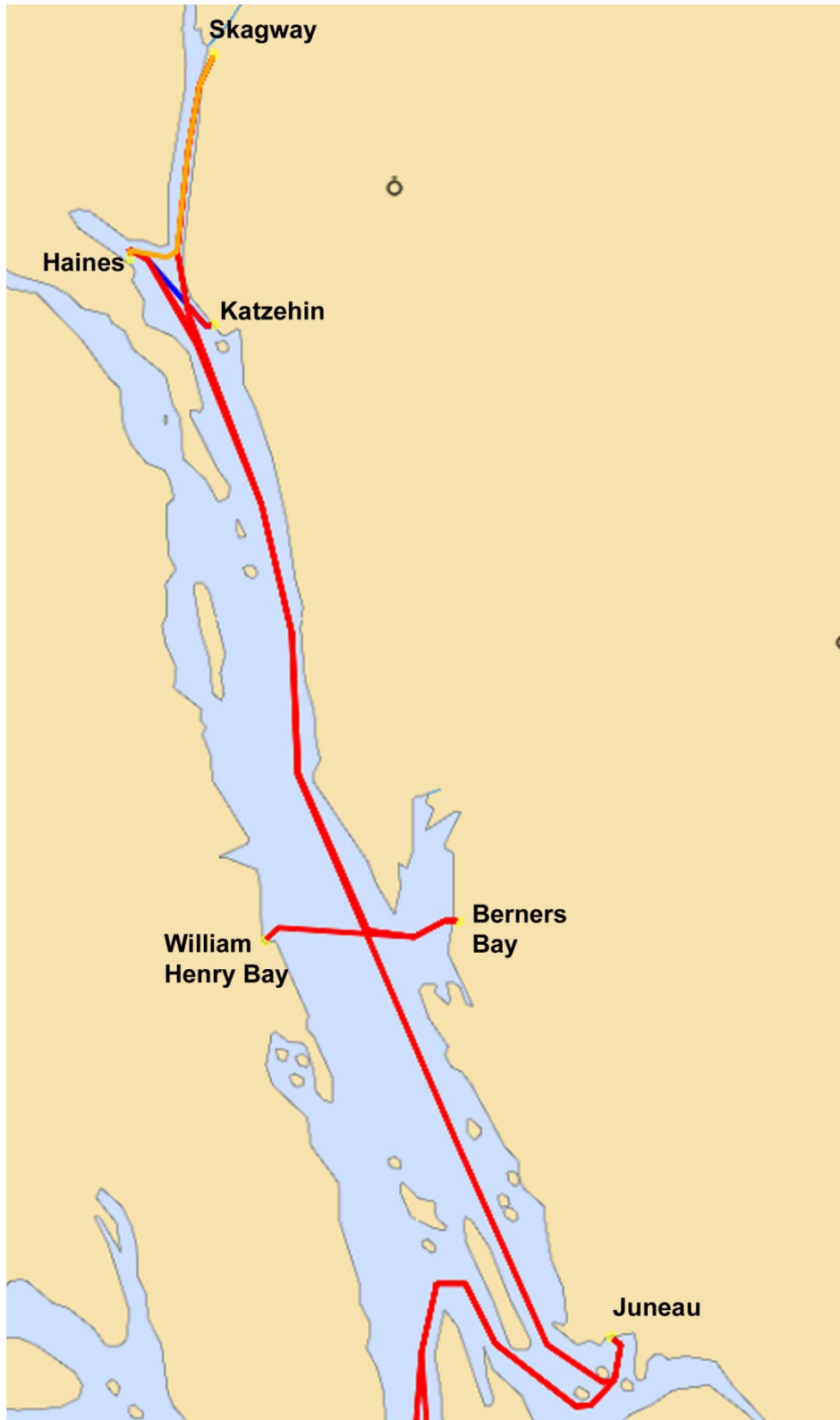
Both the Juneau Access Improvement (JAI) alternative routes and some existing AMHS routes are included in this appendix. The existing AMHS routes are based on actual navigation routes exported from the vessel's electronic charting and navigation systems. JAI routes are sample routes developed from historical JAI documentation.

Commercially available charting software was used to define each route. The path of each route is defined by waypoints (locations where vessel heading is altered). Waypoints in the route tables have been given names of adjacent geographical features for reference where appropriate, and have been identified by numerals where they occur away from prominent geographical features. All distances are measured in nautical miles (NM) and all speeds are measured in nautical miles per hour, or knots (kn).

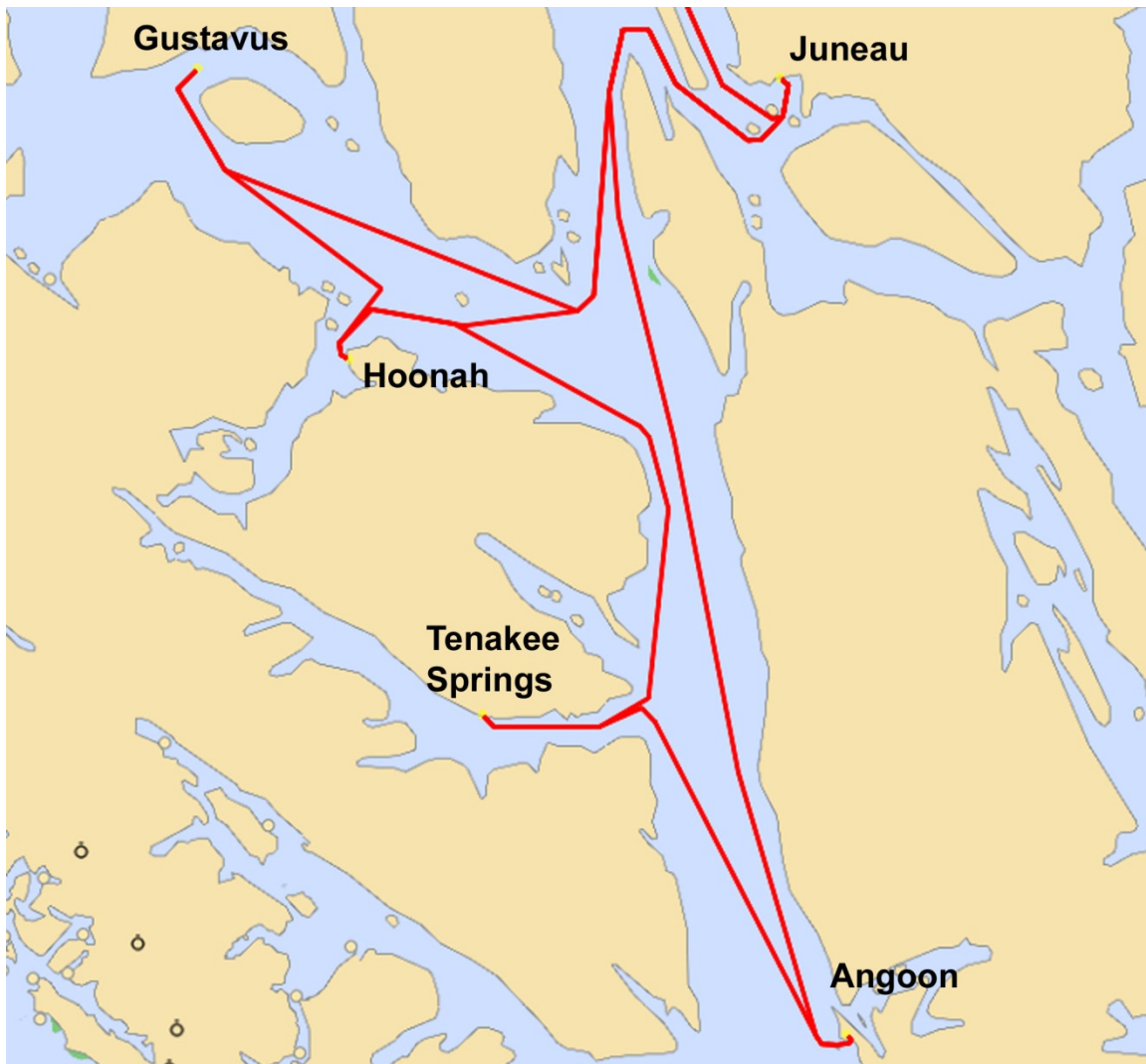
Each route was terminated approximately 0.1 nautical miles from the terminal. The remaining travel distance will be addressed as part of the mooring time (see Appendix B). Vessel speed was assigned to each leg of the route as either the assumed cruising speed 15.5 knots or assumed maneuvering speed of 5.0 knots. Waypoints at which speed changes occur are identified in the route tables.

System Overview

Lynn Canal Route Overview



North Southeast Route Overview



Prince William Sound Route Overview



Route Details

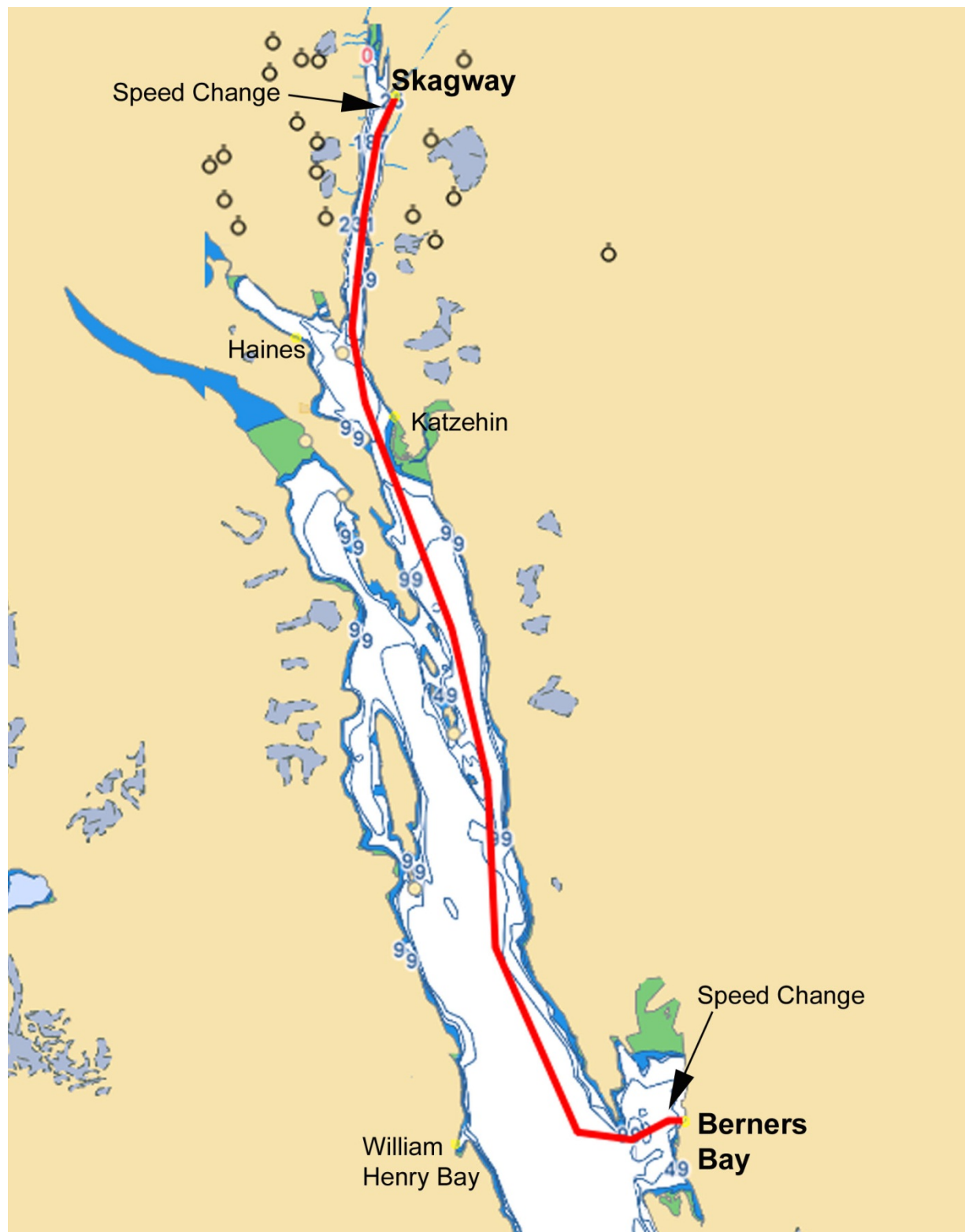
Berners Bay to Haines (BER-HNS)



Berners Bay to Haines (BER-HNS) - Route Segments, Distances & Times

Waypoint	Distance (total)	Distance (leg)	Speed (leg)	Leg Time (h:mm:ss)	Total Time (h:mm:ss)
Berners Bay					
2	0.075 NM	0.075 NM	5.00 kn	0:00:54	0:00:54
Speed Change	0.611 NM	0.536 NM	5.00 kn	0:06:26	0:07:20
Point Saint Mary	2.372 NM	1.761 NM	15.50 kn	0:06:49	0:14:09
5	4.714 NM	2.342 NM	15.50 kn	0:09:04	0:23:13
Point Sherman	13.33 NM	8.614 NM	15.50 kn	0:33:21	0:56:34
Eldred Rock	20.37 NM	7.046 NM	15.50 kn	0:27:16	1:23:50
Talsani Island	27.01 NM	6.638 NM	15.50 kn	0:25:42	1:49:32
Battery Point	35.52 NM	8.509 NM	15.50 kn	0:32:56	2:22:28
Tanani Point	40.46 NM	4.943 NM	15.50 kn	0:19:08	2:41:36
Speed Change	41.50 NM	1.035 NM	15.50 kn	0:04:00	2:45:36
Haines	41.83 NM	0.333 NM	5.00 kn	0:04:00	2:49:36

Berners Bay to Skagway (BER-SGY)



Berners Bay to Skagway (BER-SGY) - Route Segments, Distances & Times

Waypoint	Distance (total)	Distance (leg)	Speed (leg)	Leg Time (h:mm:ss)	Total Time (h:mm:ss)
Berners Bay					
2	0.075 NM	0.075 NM	5.00 kn	0:00:54	0:00:54
Speed Change	0.611 NM	0.536 NM	5.00 kn	0:06:26	0:07:20
Point Saint Mary	2.370 NM	1.759 NM	15.50 kn	0:06:49	0:14:08
5	4.704 NM	2.333 NM	15.50 kn	0:09:02	0:23:10
Point Sherman	13.31 NM	8.606 NM	15.50 kn	0:33:19	0:56:29
Eldred Rock	20.36 NM	7.046 NM	15.50 kn	0:27:16	1:23:46
Talsani Island	26.99 NM	6.636 NM	15.50 kn	0:25:41	1:49:27
Battery Point	35.50 NM	8.511 NM	15.50 kn	0:32:57	2:22:24
10	37.17 NM	1.671 NM	15.50 kn	0:06:28	2:28:52
Taiya Point	40.26 NM	3.082 NM	15.50 kn	0:11:56	2:40:48
12	45.31 NM	5.056 NM	15.50 kn	0:19:34	3:00:22
13	48.55 NM	3.237 NM	15.50 kn	0:12:32	3:12:54
Speed Change	50.04 NM	1.489 NM	15.50 kn	0:05:46	3:18:40
Skagway	50.17 NM	0.129 NM	5.00 kn	0:01:33	3:20:12

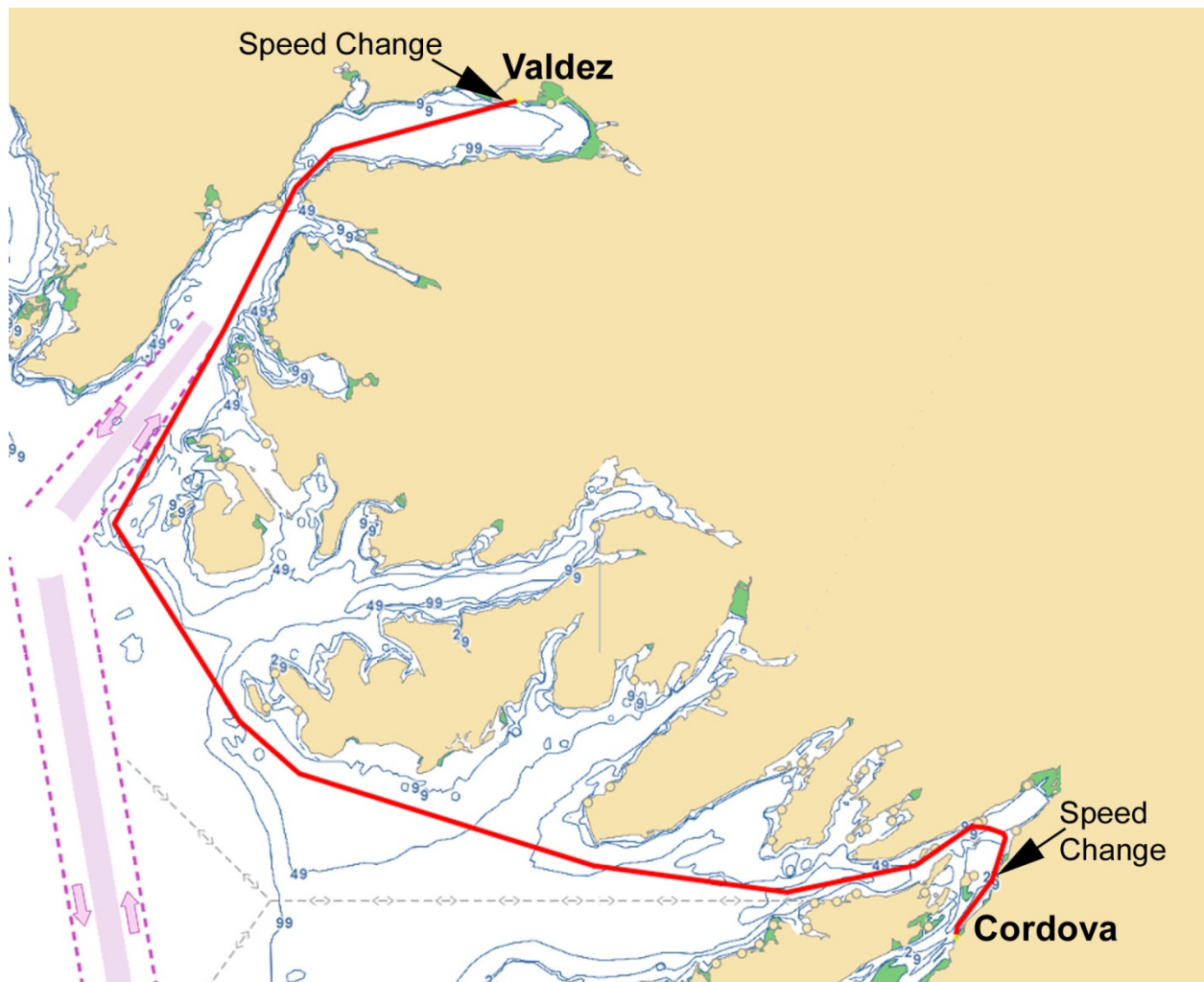
Berners Bay to William Henry Bay (BER-WHB)



Berners Bay to William Henry Bay (BER-WHB) - Route Segments, Distances & Times

Waypoint	Distance (total)	Distance (leg)	Speed (leg)	Leg Time (h:mm:ss)	Total Time (h:mm:ss)
Berners Bay					
2	0.075 NM	0.075 NM	5.00 kn	0:00:54	0:00:54
Speed Change	0.611 NM	0.536 NM	5.00 kn	0:06:26	0:07:20
Point Saint Mary	2.374 NM	1.763 NM	15.50 kn	0:06:49	0:14:09
Lance Point	9.205 NM	6.831 NM	15.50 kn	0:26:27	0:40:36
Speed Change	9.928 NM	0.723 NM	15.50 kn	0:02:48	0:43:24
William Henry Bay	10.05 NM	0.121 NM	5.00 kn	0:01:27	0:44:51

Cordova to Valdez (CDV-VDZ)



Cordova to Valdez (CDV-VDZ) - Route Segments, Distances & Times

Waypoint	Distance (total)	Distance (leg)	Speed (leg)	Leg Time (h:mm:ss)	Total Time (h:mm:ss)
Cordova					
2	0.342 NM	0.342 NM	5.00 kn	0:04:06	0:04:06
Speed Change	2.729 NM	2.387 NM	5.00 kn	0:28:39	0:32:45
4	4.516 NM	1.787 NM	15.50 kn	0:06:55	0:39:40
Shepard Point	4.717 NM	0.201 NM	15.50 kn	0:00:47	0:40:27
6	5.379 NM	0.662 NM	15.50 kn	0:02:34	0:43:00
7	6.059 NM	0.680 NM	15.50 kn	0:02:38	0:45:38
8	8.879 NM	2.819 NM	15.50 kn	0:10:55	0:56:33
Sheep Point	14.27 NM	5.394 NM	15.50 kn	0:20:53	1:17:26
Gravina Point	22.29 NM	8.019 NM	15.50 kn	0:31:02	1:48:28
Knowles Head	34.94 NM	12.65 NM	15.50 kn	0:48:58	2:37:26
Goose Island	38.21 NM	3.272 NM	15.50 kn	0:12:40	2:50:06
Bligh Reef	47.75 NM	9.534 NM	15.50 kn	0:36:54	3:27:01
Rocky Point	56.78 NM	9.035 NM	15.50 kn	0:34:58	4:01:59
Potato Point	62.40 NM	5.616 NM	15.50 kn	0:21:44	4:23:43
Entrance Point	63.30 NM	0.897 NM	15.50 kn	0:03:28	4:27:12
Entrance Island	65.40 NM	2.105 NM	15.50 kn	0:08:09	4:35:21
Speed Change	72.69 NM	7.284 NM	15.50 kn	0:28:12	5:03:32
Valdez	73.10 NM	0.419 NM	5.00 kn	0:05:02	5:08:34

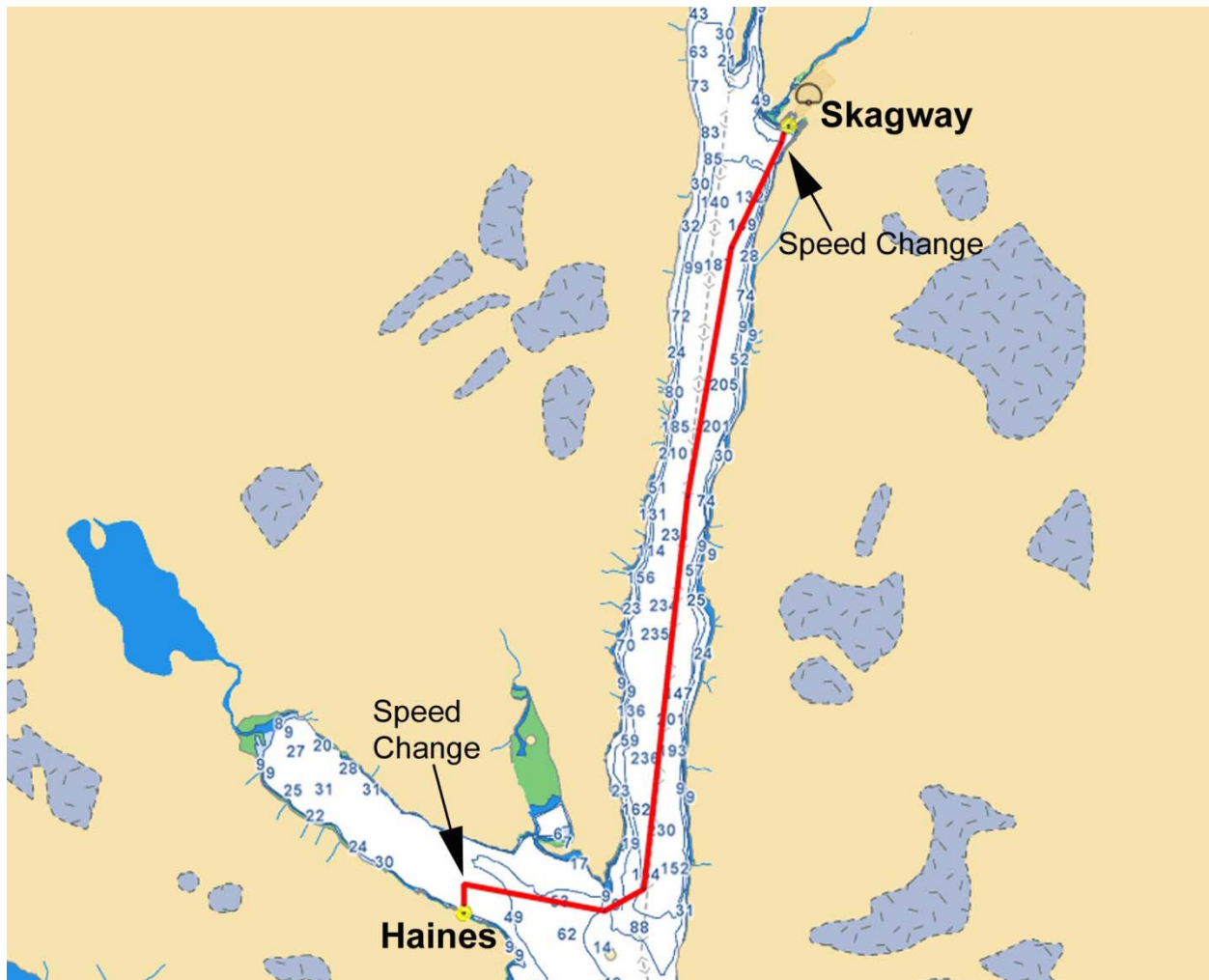
Cordova to Whittier (CDV-WTR)



Cordova to Whittier (CDV-WTR) - Route Segments, Distances & Times

Waypoint	Distance (total)	Distance (leg)	Speed (leg)	Leg Time (h:mm:ss)	Total Time (h:mm:ss)
Cordova					
2	0.342 NM	0.342 NM	5.00 kn	0:04:06	0:04:06
Speed Change	2.728 NM	2.386 NM	5.00 kn	0:28:38	0:32:44
4	4.516 NM	1.788 NM	15.50 kn	0:06:55	0:39:39
Shepard Point	4.718 NM	0.201 NM	15.50 kn	0:00:47	0:40:26
6	5.380 NM	0.662 NM	15.50 kn	0:02:34	0:43:00
7	6.060 NM	0.680 NM	15.50 kn	0:02:38	0:45:38
8	8.879 NM	2.819 NM	15.50 kn	0:10:55	0:56:33
Sheep Point	14.27 NM	5.393 NM	15.50 kn	0:20:53	1:17:25
Gravina Point	22.29 NM	8.018 NM	15.50 kn	0:31:02	1:48:27
Storey Island	56.78 NM	34.49 NM	15.50 kn	2:13:31	4:01:58
12	69.89 NM	13.11 NM	15.50 kn	0:50:45	4:52:43
Point Perry	74.24 NM	4.350 NM	15.50 kn	0:16:50	5:09:33
Point Pigot	86.32 NM	12.08 NM	15.50 kn	0:46:46	5:56:19
Decision Point	89.27 NM	2.943 NM	15.50 kn	0:11:24	6:07:42
Trinity Point	92.79 NM	3.526 NM	15.50 kn	0:13:39	6:21:21
Speed Change	96.44 NM	3.646 NM	15.50 kn	0:14:07	6:35:28
Whittier	96.71 NM	0.275 NM	5.00 kn	0:03:18	6:38:46

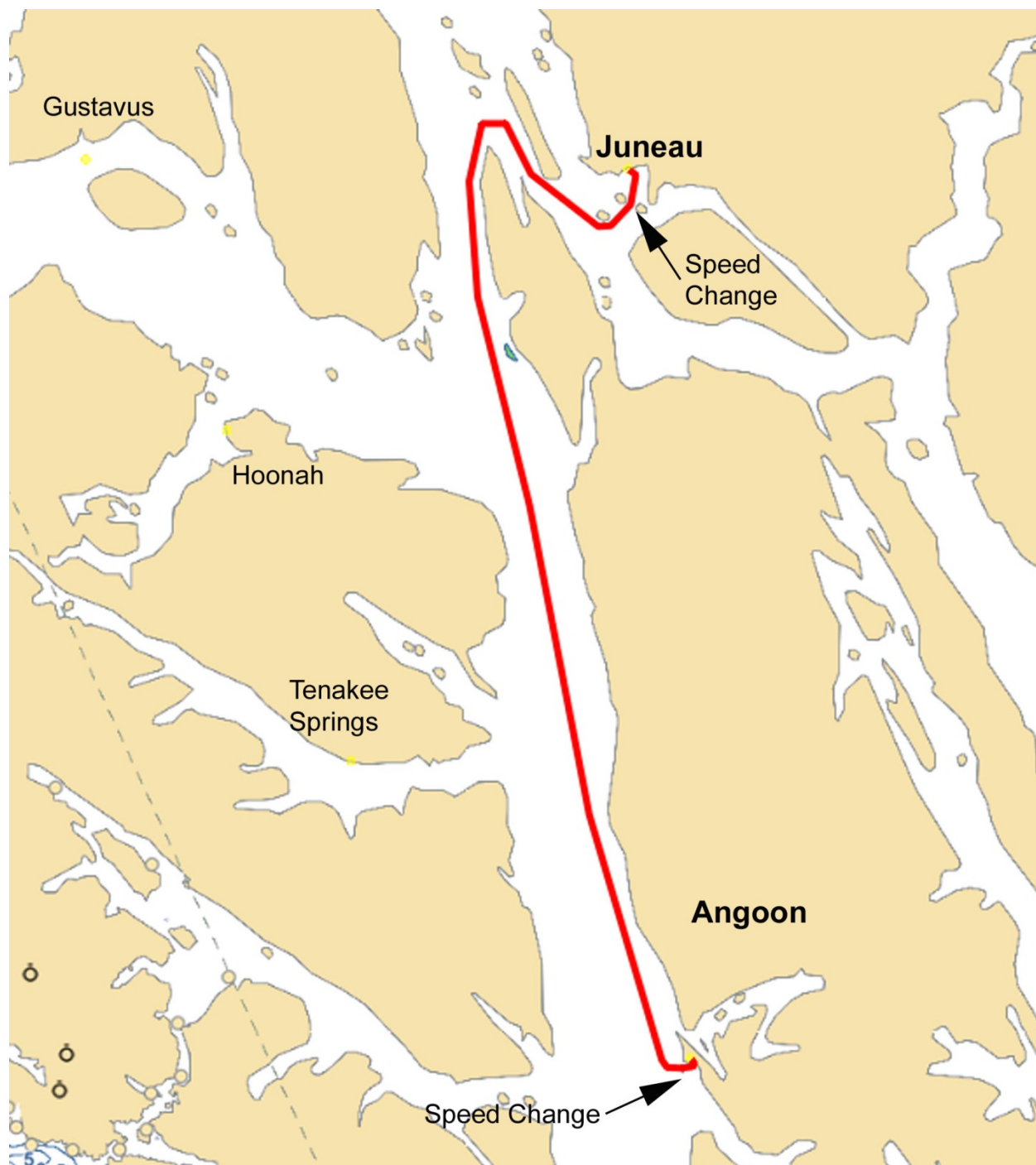
Haines to Skagway (HNS-SGY)



Haines to Skagway (HNS-SGY) - Route Segments, Distances & Times

Waypoint	Distance (total)	Distance (leg)	Speed (leg)	Leg Time (h:mm:ss)	Total Time (h:mm:ss)
Haines					
Speed Change	0.272 NM	0.272 NM	5.00 kn	0:03:16	0:03:16
Taiya Point	2.110 NM	1.838 NM	15.50 kn	0:07:07	0:10:23
4	2.689 NM	0.579 NM	15.50 kn	0:02:14	0:12:37
5	7.749 NM	5.060 NM	15.50 kn	0:19:35	0:32:12
6	10.99 NM	3.237 NM	15.50 kn	0:12:32	0:44:44
Speed Change	12.48 NM	1.490 NM	15.50 kn	0:05:46	0:50:30
Skagway	12.60 NM	0.129 NM	5.00 kn	0:01:33	0:52:03

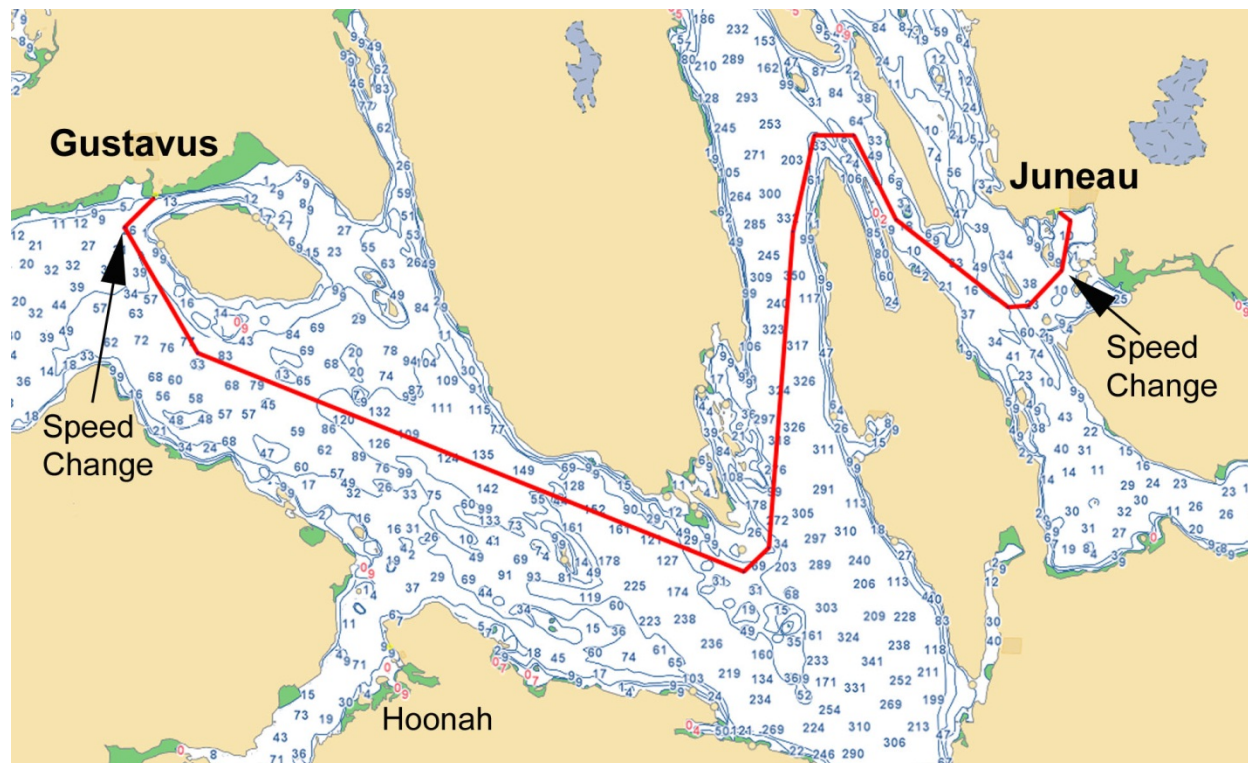
Juneau to Angoon (JNU-ANG)



Juneau to Angoon (JNU-ANG) - Route Segments, Distances & Times

Waypoint	Distance (total)	Distance (leg)	Speed (leg)	Leg Time (h:mm:ss)	Total Time (h:mm:ss)
Juneau					
2	0.514 NM	0.514 NM	5.00 kn	0:06:10	0:06:10
Speed Change	2.346 NM	1.832 NM	5.00 kn	0:21:59	0:28:09
4	4.106 NM	1.760 NM	15.50 kn	0:06:49	0:34:58
Portland Island	4.866 NM	0.760 NM	15.50 kn	0:02:57	0:37:54
Barlow Point	10.05 NM	5.188 NM	15.50 kn	0:20:05	0:57:59
7	13.48 NM	3.423 NM	15.50 kn	0:13:15	1:11:14
8	14.92 NM	1.445 NM	15.50 kn	0:05:36	1:16:50
False Point Retreat	18.51 NM	3.584 NM	15.50 kn	0:13:52	1:30:42
Funter Bay	25.54 NM	7.039 NM	15.50 kn	0:27:15	1:57:57
Point Marsden	38.70 NM	13.16 NM	15.50 kn	0:50:57	2:48:54
12	58.02 NM	19.32 NM	15.50 kn	1:14:47	4:03:41
Point Samuel	73.90 NM	15.88 NM	15.50 kn	1:01:28	5:05:09
14	74.47 NM	0.573 NM	15.50 kn	0:02:13	5:07:22
Speed Change	75.36 NM	0.891 NM	15.50 kn	0:03:27	5:10:49
16	76.06 NM	0.697 NM	5.00 kn	0:08:22	5:19:11
17	76.29 NM	0.232 NM	5.00 kn	0:02:47	5:21:58
Angoon	76.60 NM	0.311 NM	5.00 kn	0:03:44	5:25:42

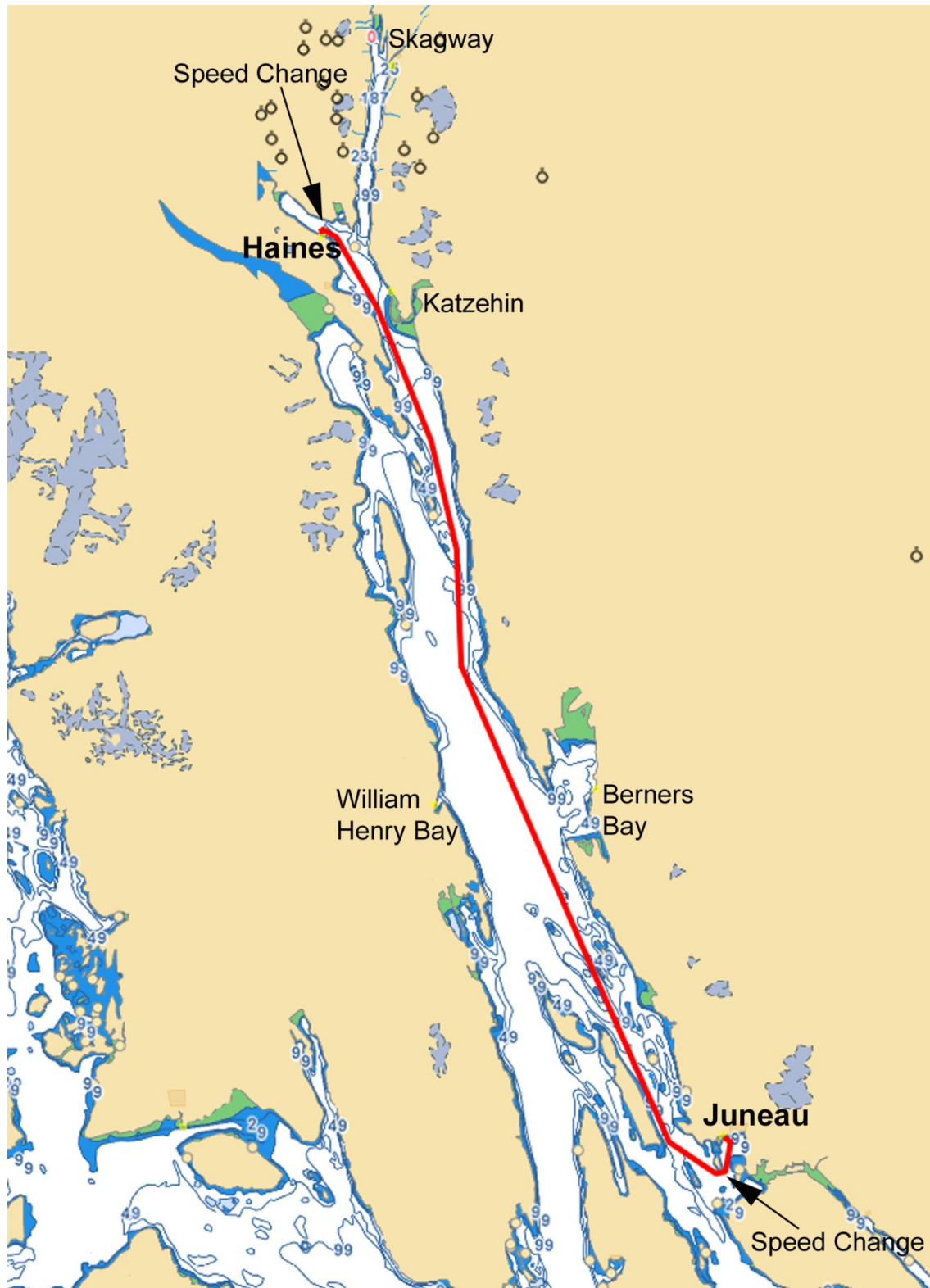
Juneau to Gustavus (JNU-GUS)



Juneau to Gustavus (JNU-GUS) - Route Segments, Distances & Times

Waypoint	Distance (total)	Distance (leg)	Speed (leg)	Leg Time (h:mm:ss)	Total Time (h:mm:ss)
Juneau					
2	0.513 NM	0.513 NM	5.00 kn	0:06:09	0:06:09
Speed Change	2.342 NM	1.829 NM	5.00 kn	0:21:57	0:28:06
4	4.103 NM	1.761 NM	15.50 kn	0:06:49	0:34:55
Portland Island	4.863 NM	0.760 NM	15.50 kn	0:02:57	0:37:52
Barlow Point	10.05 NM	5.189 NM	15.50 kn	0:20:05	0:57:57
7	13.47 NM	3.422 NM	15.50 kn	0:13:15	1:11:12
8	14.92 NM	1.446 NM	15.50 kn	0:05:36	1:16:48
False Point Retreat	18.50 NM	3.582 NM	15.50 kn	0:13:52	1:30:40
10	30.07 NM	11.57 NM	15.50 kn	0:44:47	2:15:27
Swanson Harbor	31.35 NM	1.274 NM	15.50 kn	0:04:56	2:20:23
Pleasant Island Reef	52.90 NM	21.55 NM	15.50 kn	1:23:25	3:43:48
Speed Change	58.20 NM	5.302 NM	15.50 kn	0:20:31	4:04:19
Gustavus	59.73 NM	1.533 NM	5.00 kn	0:18:24	4:22:43

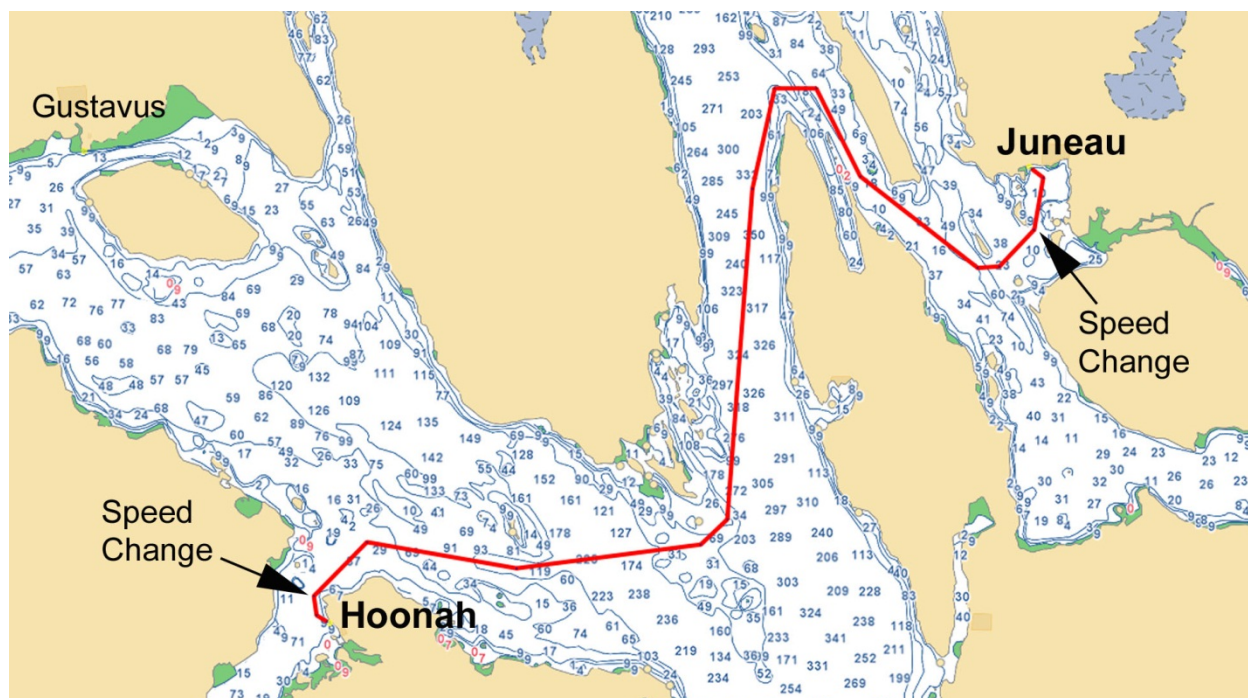
Juneau to Haines (JNU-HNS)



Juneau to Haines (JNU-HNS) - Route Segments, Distances & Times

Waypoint	Distance (total)	Distance (leg)	Speed (leg)	Leg Time (h:mm:ss)	Total Time (h:mm:ss)
Juneau					
2	0.512 NM	0.512 NM	5.00 kn	0:06:09	0:06:09
Speed Change	2.342 NM	1.830 NM	5.00 kn	0:21:58	0:28:06
4	2.937 NM	0.595 NM	15.50 kn	0:02:18	0:30:24
Point Lena	6.366 NM	3.429 NM	15.50 kn	0:13:16	0:43:41
Sentinel Island	17.58 NM	11.21 NM	15.50 kn	0:43:24	1:27:04
Point Sherman	37.83 NM	20.26 NM	15.50 kn	1:18:26	2:45:30
Eldred Rock	44.88 NM	7.043 NM	15.50 kn	0:27:16	3:12:46
Talsani Island	51.51 NM	6.636 NM	15.50 kn	0:25:41	3:38:27
Battery Point	60.09 NM	8.573 NM	15.50 kn	0:33:11	4:11:38
Tanani Point	64.92 NM	4.835 NM	15.50 kn	0:18:43	4:30:21
Speed Change	65.94 NM	1.017 NM	15.50 kn	0:03:56	4:34:17
Haines	66.24 NM	0.307 NM	5.00 kn	0:03:41	4:37:58

Juneau to Hoonah (JNU-HNH)



Juneau to Hoonah (JNU-HNH) - Route Segments, Distances & Times

Waypoint	Distance (total)	Distance (leg)	Speed (leg)	Leg Time (h:mm:ss)	Total Time (h:mm:ss)
Juneau					
2	0.515 NM	0.515 NM	5.00 kn	0:06:11	0:06:11
Speed Change	2.348 NM	1.834 NM	5.00 kn	0:22:00	0:28:11
4	4.110 NM	1.762 NM	15.50 kn	0:06:49	0:35:01
Portland Island	4.871 NM	0.761 NM	15.50 kn	0:02:57	0:37:57
Barlow Point	10.06 NM	5.190 NM	15.50 kn	0:20:05	0:58:03
7	13.48 NM	3.422 NM	15.50 kn	0:13:15	1:11:17
8	14.93 NM	1.445 NM	15.50 kn	0:05:36	1:16:53
False Point Retreat	18.51 NM	3.582 NM	15.50 kn	0:13:52	1:30:45
10	30.08 NM	11.57 NM	15.50 kn	0:44:47	2:15:32
Swanson Harbor	31.36 NM	1.276 NM	15.50 kn	0:04:56	2:20:29
Sisters Reef	37.86 NM	6.506 NM	15.50 kn	0:25:11	2:45:40
Point Sophia	43.19 NM	5.323 NM	15.50 kn	0:20:36	3:06:16
Speed Change	45.84 NM	2.653 NM	15.50 kn	0:10:16	3:16:32
Hoonah Point	46.52 NM	0.681 NM	5.00 kn	0:08:10	3:24:43
Hoonah	46.95 NM	0.433 NM	5.00 kn	0:05:12	3:29:54

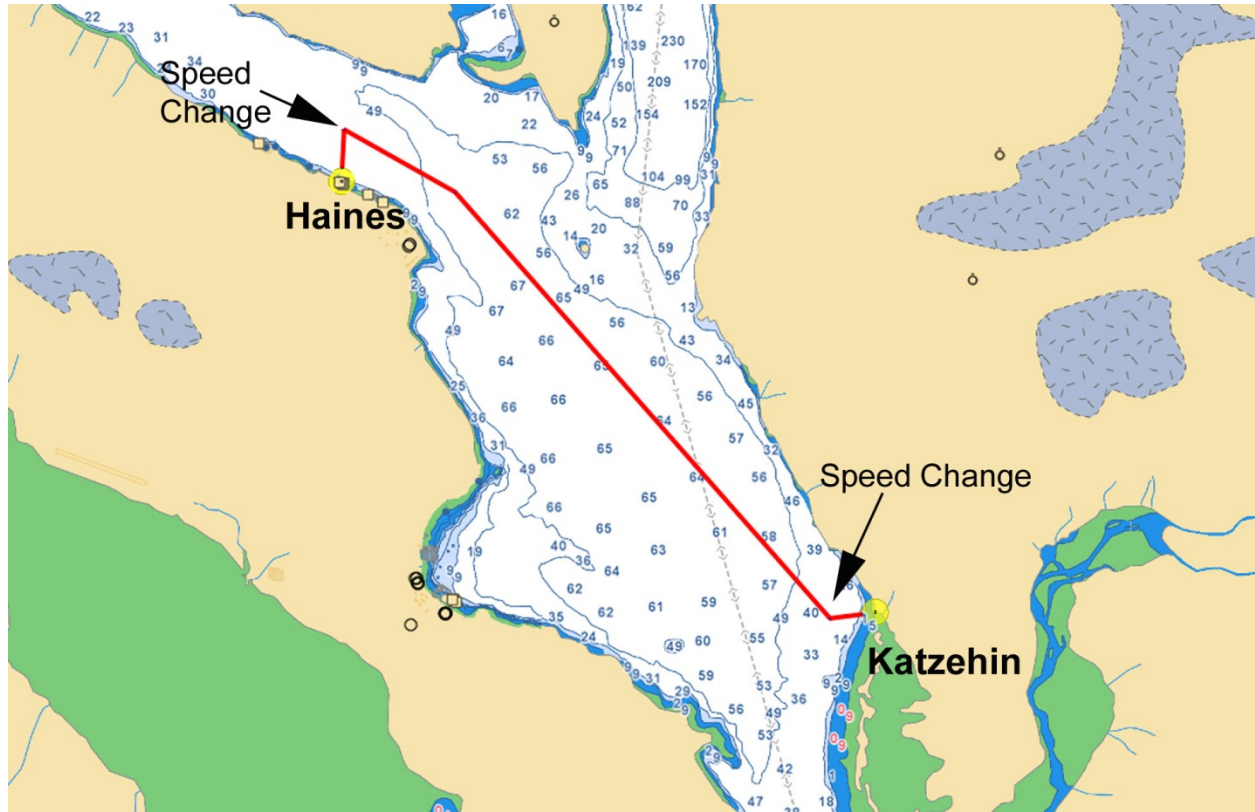
Juneau to Skagway (JNU-SGY)



Juneau to Skagway (JNU-SGY) - Route Segments, Distances & Times

Waypoint	Distance (total)	Distance (leg)	Speed (leg)	Leg Time (h:mm:ss)	Total Time (h:mm:ss)
Juneau					
2	0.512 NM	0.512 NM	5.00 kn	0:06:09	0:06:09
Speed Change	2.341 NM	1.829 NM	5.00 kn	0:21:57	0:28:06
4	2.934 NM	0.594 NM	15.50 kn	0:02:18	0:30:23
Point Lena	6.363 NM	3.428 NM	15.50 kn	0:13:16	0:43:40
Sentinal Island	17.57 NM	11.21 NM	15.50 kn	0:43:24	1:27:03
Point Sherman	37.83 NM	20.25 NM	15.50 kn	1:18:23	2:45:27
Eldred Rock	44.87 NM	7.043 NM	15.50 kn	0:27:16	3:12:42
Talsani Island	51.51 NM	6.635 NM	15.50 kn	0:25:41	3:38:23
10	61.69 NM	10.18 NM	15.50 kn	0:39:24	4:17:48
Taiya Point	64.77 NM	3.082 NM	15.50 kn	0:11:56	4:29:44
12	69.82 NM	5.056 NM	15.50 kn	0:19:34	4:49:18
13	73.06 NM	3.237 NM	15.50 kn	0:12:32	5:01:50
Speed Change	74.55 NM	1.490 NM	15.50 kn	0:05:46	5:07:36
Skagway	74.68 NM	0.129 NM	5.00 kn	0:01:33	5:09:09

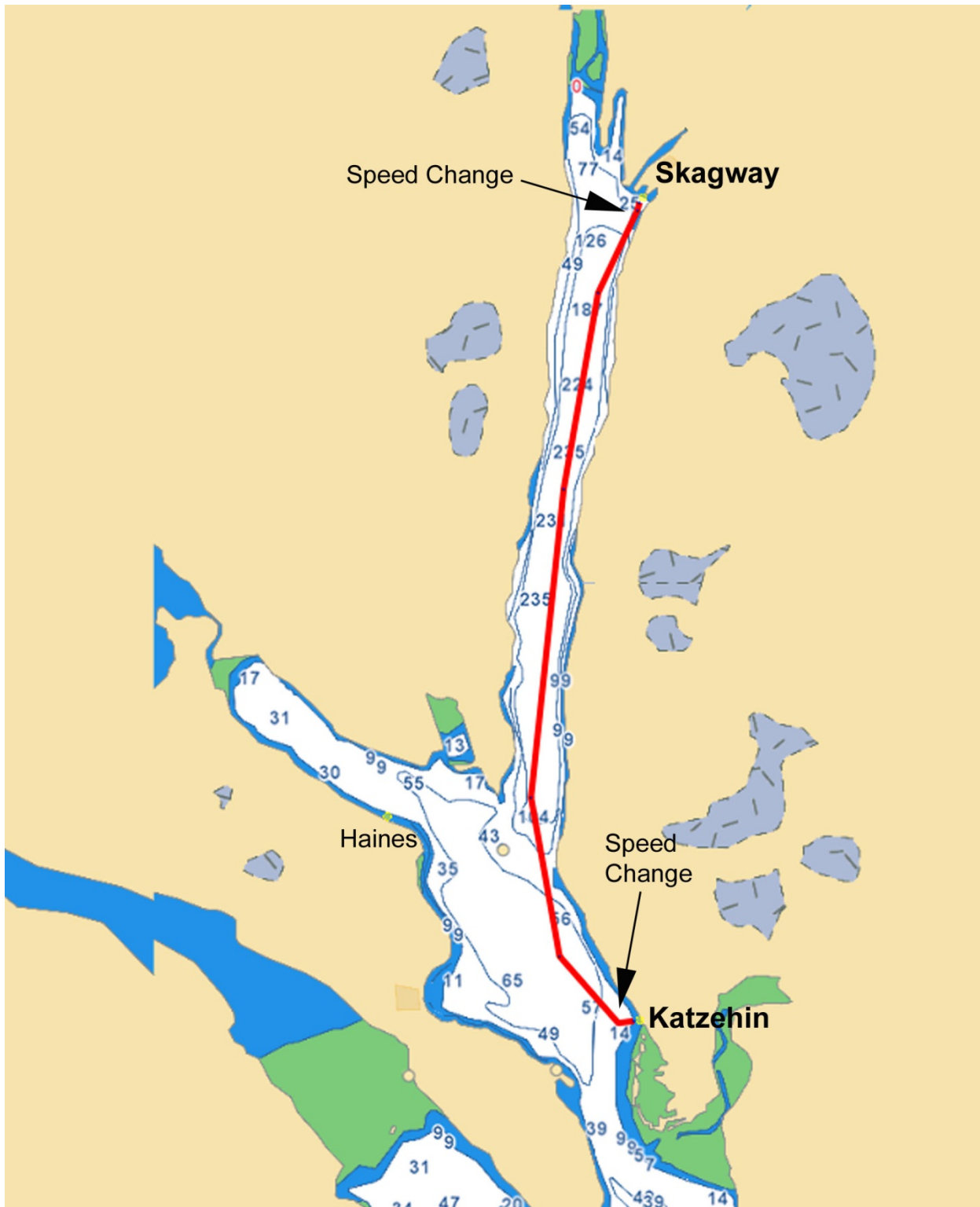
Katzehin to Haines (KTZ-HNS)



Katzehin to Haines (KTZ-HNS) - Route Segments, Distances & Times

Waypoint	Distance (total)	Distance (leg)	Speed (leg)	Leg Time (h:mm:ss)	Total Time (h:mm:ss)
Katzehin					
Speed Change	0.254 NM	0.254 NM	5.00 kn	0:03:03	0:03:03
Tanani Point	4.638 NM	4.384 NM	15.50 kn	0:16:58	0:20:01
Speed Change	5.620 NM	0.983 NM	15.50 kn	0:03:48	0:23:49
Haines	5.919 NM	0.299 NM	5.00 kn	0:03:35	0:27:25

Katzehin to Skagway (KTZ-SGY)



Katzehin to Skagway (KTZ-SGY) - Route Segments, Distances & Times

Waypoint	Distance (total)	Distance (leg)	Speed (leg)	Leg Time (h:mm:ss)	Total Time (h:mm:ss)
Katzehin					
Speed Change	0.253 NM	0.253 NM	5.00 kn	0:03:02	0:03:02
3	1.708 NM	1.455 NM	15.50 kn	0:05:38	0:08:40
Taiya Point	4.342 NM	2.634 NM	15.50 kn	0:10:12	0:18:52
5	9.398 NM	5.056 NM	15.50 kn	0:19:34	0:38:26
6	12.63 NM	3.237 NM	15.50 kn	0:12:32	0:50:58
Speed Change	14.12 NM	1.489 NM	15.50 kn	0:05:46	0:56:44
Skagway	14.25 NM	0.128 NM	5.00 kn	0:01:32	0:58:16