

APPENDIX G: SATURN MODEL VALIDATION

Junction Turning Counts - AM Comparison of Modelled Flows with Input Counts

ANODE	BNODE	CNODE	COUNT	MODELLED FLOW	CAPACITY	DIFFERENCE	% DIFFERENCE	GEH
301	185	302	460	536	3400	76	16.43	3.39
108	109	406	156	201	419	45	28.97	3.38
204	305	168	110	148	268	38	34.48	3.34
305	161	156	186	221	1412	35	18.78	2.45
167	303	301	268	299	340	31	11.42	1.82
182	305	169	113	144	193	31	27.65	2.75
302	183	132	734	765	1700	31	4.16	1.12
503	122	121	8	37	547	29	365.18	6.14
132	183	302	423	450	2000	27	6.28	1.27
183	302	185	423	450	900	27	6.28	1.27
302	185	301	423	450	2000	27	6.28	1.27
168	305	161	118	144	261	26	21.89	2.26
301	303	167	135	158	472	23	17.37	1.94
169	305	161	244	265	434	21	8.49	1.3
153	154	157	290	310	499	20	6.92	1.16
307	304	309	284	304	702	20	6.92	1.15
155	153	154	389	408	574	19	4.88	0.95
202	104	106	126	144	1477	18	14.4	1.56
306	139	308	119	135	1267	16	13.71	1.45
131	502	132	462	477	1127	15	3.18	0.68
401	101	403	47	62	1567	15	32.97	2.09
168	305	204	30	38	148	8	27.65	1.42
301	303	304	438	445	671	7	1.66	0.35
204	305	161	5	12	29	7	145.01	2.47
408	134	131	293	298	1700	5	1.86	0.32
303	304	309	91	96	719	5	5.29	0.5
1	101	401	70	73	1261	3	3.67	0.3
304	303	301	453	456	653	3	0.66	0.14
407	134	131	196	198	301	2	1.05	0.15
157	154	153	273	275	568	2	0.58	0.1
401	101	1	33	35	1634	2	6.82	0.39
109	501	9	85	87	1345	2	2.86	0.26
131	134	407	155	156	263	1	0.51	0.06
151	153	154	221	222	1695	1	0.23	0.03
131	502	404	63	64	714	1	1.12	0.09
132	502	131	325	326	1220	1	0.34	0.06
501	109	406	219	220	1576	1	0.56	0.08
503	122	124	20	21	601	1	3.38	0.15
303	304	307	399	400	822	1	0.37	0.07
136	184	410	100	101	1600	1	0.7	0.07
184	410	185	100	101	10000	1	0.7	0.07
410	185	301	100	101	409	1	0.7	0.07
153	154	156	320	319	1700	0	-0.18	0.03
404	502	131	35	35	841	0	0.02	0
404	502	132	598	598	1404	0	0.04	0.01
406	109	501	219	218	1193	0	-0.24	0.04

Junction Turning Counts - AM Comparison of Modelled Flows with Input Counts

ANODE	BNODE	CNODE	COUNT	MODELLED FLOW	CAPACITY	DIFFERENCE	% DIFFERENCE	GEH
406	109	108	155	154	401	0	-0.56	0.07
108	109	501	107	107	256	0	-0.29	0.03
202	104	4	52	51	1467	0	-2.2	0.16
106	104	4	11	11	670	0	-2.26	0.08
106	104	403	103	103	418	0	0.41	0.04
4	104	106	24	23	527	0	-3	0.15
403	101	401	49	49	394	0	0.24	0.02
142	139	308	147	146	326	0	-0.38	0.05
123	122	121	1	0	635	0	-100	0
123	122	124	3	2	477	0	-31.06	0.59
121	122	124	98	97	1665	0	-0.72	0.07
109	501	111	239	238	1496	0	-0.53	0.08
111	501	109	119	119	1503	0	0.41	0.04
111	501	9	10	10	1394	0	3.39	0.11
309	304	303	74	74	132	0	0.61	0.05
307	304	303	383	382	1289	0	-0.38	0.07
161	305	204	1	0	74	0	-100	0
204	305	182	19	18	33	0	-3.54	0.16
407	134	408	2	0	41	-1	-100	2
403	104	106	156	154	410	-1	-1.02	0.13
121	122	503	35	33	1508	-1	-6.45	0.39
168	305	182	2	0	97	-1	-99.96	2
4	104	202	128	125	1627	-2	-2.73	0.31
309	304	307	286	283	513	-2	-0.88	0.15
185	302	184	99	96	493	-2	-2.8	0.28
302	184	136	99	96	1700	-2	-2.8	0.28
182	305	168	4	0	45	-3	-98.72	2.77
124	122	121	95	90	1644	-4	-5.34	0.53
9	501	109	222	217	1478	-4	-2.25	0.34
169	305	204	5	0	156	-4	-100	3.16
408	134	407	6	0	1319	-5	-100	3.46
403	101	1	92	86	605	-5	-6.79	0.66
1	101	403	166	160	595	-5	-3.36	0.44
161	305	182	6	0	76	-5	-99.48	3.44
4	104	403	10	3	1417	-6	-68.02	2.65
124	122	123	7	0	1463	-6	-100	3.74
132	183	409	405	396	1750	-8	-2.17	0.44
183	409	184	405	396	10000	-8	-2.17	0.44
409	184	136	405	396	475	-8	-2.17	0.44
204	305	169	11	0	25	-10	-100	4.69
403	104	4	13	1	293	-11	-89.34	4.33
9	501	111	20	8	1269	-11	-60.35	3.23
132	502	404	482	469	1362	-12	-2.78	0.61
501	109	108	131	116	1393	-14	-11.24	1.32
154	153	151	120	104	1700	-15	-13.69	1.55
308	139	306	150 >	134	134	-15	-10.48	1.32

Junction Turning Counts - AM Comparison of Modelled Flows with Input Counts

ANODE	BNODE	CNODE	COUNT	MODELLED FLOW	CAPACITY	DIFFERENCE	% DIFFERENCE	GEH
182	305	204	47	29	73	-17	-38.23	2.91
106	104	202	142	123	409	-18	-13.3	1.64
167	303	304	71	51	88	-19	-28.1	2.55
185	302	183	460	439	1045	-20	-4.49	0.97
154	153	155	426	403	503	-22	-5.3	1.11
308	139	142	255 >	231	231	-23	-9.46	1.55
168	305	169	31	5	165	-25	-83.67	6.11
169	305	182	45	15	184	-29	-67.58	5.57
157	154	156	32	0	125	-31	-100	8
306	139	142	387	354	1556	-32	-8.63	1.74
155	153	151	38	2	293	-35	-94.66	8.04
161	305	168	164	128	211	-35	-21.88	2.97
305	161	164	237	200	1465	-36	-15.64	2.51
131	134	408	228	190	807	-37	-16.56	2.61
156	161	164	218	178	304	-39	-18.54	2.87
182	305	161	40	0	44	-39	-99.88	8.93
156	154	153	273	232	1700	-40	-14.87	2.55
164	161	305	179	132	450	-46	-26.16	3.75
503	122	123	47	0	434	-46	-100	9.7
169	305	168	51	3	155	-47	-94.97	9.36
136	184	302	373	325	1700	-47	-12.81	2.56
184	302	183	373 >	325	352	-47	-12.81	2.56
142	139	306	341	288	1066	-52	-15.49	2.98
124	122	503	81	20	572	-60	-75.41	8.6
156	154	157	62	0	1381	-61	-100	11.14
156	161	305	132 >	65	116	-66	-51.07	6.8
202	104	403	100	28	532	-71	-71.74	8.96
161	305	169	147 >	69	143	-77	-53.32	7.55
123	122	503	84	0	539	-83	-99.99	12.96
164	161	156	274 >	188	236	-85	-31.28	5.64
151	153	155	112	5	1392	-106	-95.45	13.97
403	104	202	242	67	395	-174	-72.26	14.07

ATCs - AM Comparison of Modelled Flows with Input Counts

ANODE	BNODE	CNODE	COUNT	MODELLED FLOW	CAPACITY	DIFFERENCE	% DIFFERENCE	GEH
134	131	0	442	497	1700	55	12.33	2.52
115	116	0	72	121	1700	49	68.57	5.02
131	134	0	322	346	543	24	7.46	1.31
172	169	0	263	281	2206	18	6.97	1.11
13	118	0	108	115	1620	7	6.71	0.69
116	115	0	272	276	1681	4	1.43	0.24
118	13	0	104	104	1800	0	-0.15	0.02
17	128	0	309	309	1608	0	0.03	0
15	121	0	149	149	1176	0	0	0
402	203	0	159	159	900	0	0.15	0.02
203	402	0	107	107	10000	0	-0.04	0
501	9	0	98	98	1800	0	-0.23	0.02
9	501	0	225	225	1486	0	-0.03	0
4	104	0	151	151	1301	0	-0.01	0
101	1	0	121	121	1800	0	0	0
1	101	0	233	233	774	0	-0.01	0
57	405	0	614	614	10000	0	0	0
169	172	0	303	303	1678	0	-0.13	0.02
128	17	0	222	220	1800	-1	-0.98	0.15
104	4	u/m	63	63/61	1800	-1	-3.18	0.25
121	15	u/m	93	93/89	1800	-3	-4.31	0.42
405	57	u/m	201	201/189	1800	-11	-5.97	0.86

Junction Turning Counts - PM Comparison of Modelled Flows with Input Counts

ANODE	BNODE	CNODE	COUNT	MODELLED FLOW	CAPACITY	DIFFERENCE	% DIFFERENCE	GEH
302	183	132	745	852	1700	107	14.37	3.79
161	305	168	96	147	219	51	53.38	4.65
167	303	301	185	235	306	50	27.29	3.48
185	302	183	541	591	1083	50	9.25	2.1
307	304	309	319	348	692	29	9.08	1.59
169	305	168	28	50	186	22	79.26	3.55
303	304	309	70	90	622	20	28.59	2.24
301	185	302	676	696	3400	20	2.98	0.77
154	153	155	374	393	575	19	5.17	0.99
132	502	131	406	425	1241	19	4.57	0.91
406	109	108	130	149	410	19	14.6	1.61
157	154	153	313	331	572	18	5.85	1.02
123	122	124	17	34	455	17	101.1	3.4
111	501	109	199	215	1400	16	8.12	1.12
301	303	304	434	448	706	14	3.16	0.65
132	502	404	467	480	1296	13	2.79	0.6
503	122	121	9	22	548	13	142.59	3.27
106	104	403	135	147	404	12	9.26	1.05
403	101	401	56	68	374	12	22.02	1.56
142	139	308	129	140	307	11	8.72	0.97
204	305	168	68	79	162	11	16.3	1.29
131	134	408	209	219	653	10	4.94	0.71
106	104	202	126	136	376	10	7.97	0.88
164	161	305	143	151	1231	8	5.74	0.68
182	305	204	67	75	114	8	11.55	0.92
136	184	410	91	97	1600	6	6.79	0.64
184	410	185	91	97	10000	6	6.79	0.64
410	185	301	91	97	411	6	6.79	0.64
501	109	406	201	206	1568	5	2.63	0.37
309	304	303	82	87	151	5	5.79	0.52
308	139	306	98	101	167	3	3.17	0.31
407	134	131	123	124	328	1	0.61	0.07
501	109	108	123	124	1406	1	0.68	0.08
403	104	106	110	111	418	1	0.48	0.05
9	501	109	114	115	1401	1	0.86	0.09
182	305	169	42	43	87	1	2.89	0.19
153	154	157	300	299	503	0	-0.21	0.04
156	154	153	226	226	1700	0	-0.18	0.03
154	153	151	165	164	1700	0	-0.89	0.11
131	502	404	30	30	863	0	-0.23	0.01
305	161	156	176	175	1408	0	-0.62	0.08
4	104	106	11	11	532	0	0.09	0
401	101	403	56	56	1537	0	0	0
401	101	1	67	67	1641	0	-0.62	0.05
1	101	403	128	128	592	0	0.01	0
123	122	121	1	0	550	0	-100	0

Junction Turning Counts - PM Comparison of Modelled Flows with Input Counts

ANODE	BNODE	CNODE	COUNT	MODELLED FLOW	CAPACITY	DIFFERENCE	% DIFFERENCE	GEH
121	122	123	1	0	528	0	-100	0
503	122	124	8	8	622	0	0.05	0
124	122	503	16	15	587	0	-6.25	0.25
109	501	111	97	96	1378	0	-0.98	0.1
9	501	111	3	3	1289	0	0.55	0.01
167	303	304	59	58	120	0	-0.9	0.07
309	304	307	330	330	605	0	0	0
169	305	161	277	276	427	0	-0.29	0.05
202	104	4	116	114	1478	-1	-2.11	0.23
4	104	202	65	63	1656	-1	-2.55	0.21
403	104	4	10	8	342	-1	-20.91	0.7
403	101	1	130	128	564	-1	-1.25	0.14
121	122	124	77	75	1700	-1	-2.15	0.19
182	305	168	2	0	41	-1	-99.66	1.99
161	305	204	2	0	64	-1	-100	2
132	183	302	446	444	2000	-1	-0.49	0.1
183	302	185	446	444	880	-1	-0.49	0.1
302	185	301	446	444	2000	-1	-0.49	0.1
306	139	308	115	112	1179	-2	-3.03	0.33
124	122	121	128	125	1660	-2	-2.71	0.31
407	134	408	4	0	65	-3	-100	2.83
155	153	154	405	401	655	-3	-1.01	0.2
406	109	501	198	194	1217	-3	-1.83	0.26
106	104	4	17	13	633	-3	-26.26	1.16
303	304	307	420	416	711	-3	-0.91	0.19
161	305	182	4	0	66	-3	-100	2.83
168	305	161	107	103	120	-3	-3.63	0.38
308	139	142	150	145	247	-4	-3.59	0.44
168	305	182	5	0	0	-4	-99.99	3.16
132	183	409	456	451	1750	-4	-1.19	0.25
183	409	184	456	451	10000	-4	-1.19	0.25
409	184	136	456	451	462	-4	-1.19	0.25
124	122	123	6	0	1445	-5	-100	3.46
109	501	9	216	209	1491	-6	-3.26	0.48
111	501	9	16	9	1194	-6	-43.46	1.96
108	109	406	101	93	426	-7	-7.45	0.76
4	104	403	18	10	1509	-7	-44.74	2.15
204	305	182	13 >	5	10	-7	-61.43	2.66
204	305	161	8	0	0	-7	-100	4
169	305	204	9	0	139	-8	-100	4.24
404	502	132	530	520	1305	-9	-1.89	0.44
503	122	123	10	0	447	-9	-100	4.47
121	122	503	11	0	1529	-10	-100	4.69
307	304	303	384	373	1267	-10	-2.97	0.59
182	305	161	11	0	40	-10	-99.54	4.66
204	305	169	11	0	0	-10	-100	4.69

Junction Turning Counts - PM Comparison of Modelled Flows with Input Counts

ANODE	BNODE	CNODE	COUNT	MODELLED FLOW	CAPACITY	DIFFERENCE	% DIFFERENCE	GEH
1	101	401	57	45	1342	-11	-20.43	1.63
131	502	132	413	399	1231	-13	-3.49	0.72
123	122	503	41	25	516	-15	-39.13	2.79
301	303	167	150	134	482	-15	-10.64	1.34
202	104	106	131	110	1394	-20	-15.96	1.9
151	153	154	100	77	1698	-22	-22.75	2.42
157	154	156	26	0	120	-25	-99.96	7.21
153	154	156	205	179	1700	-25	-12.8	1.89
168	305	204	77 >	51	66	-25	-33.78	3.25
408	134	131	295	267	1700	-27	-9.62	1.69
408	134	407	29	0	1349	-28	-100	7.62
131	134	407	228	199	281	-28	-12.76	1.99
404	502	131	72	43	828	-28	-40.2	3.82
108	109	501	140	111	345	-28	-20.99	2.62
156	154	157	30	0	1388	-29	-100	7.75
185	302	184	135	105	535	-29	-22.18	2.73
302	184	136	135	105	1700	-29	-22.18	2.73
156	161	305	115	84	126	-30	-26.78	3.09
168	305	169	31 >	0	1	-30	-99.64	7.83
156	161	164	244	212	294	-31	-12.98	2.1
155	153	151	38	4	325	-33	-89.43	7.41
142	139	306	292	258	1042	-33	-11.6	2.04
304	303	301	494	459	672	-34	-7.02	1.59
151	153	155	38	2	1527	-35	-94.68	8.04
136	184	302	304	261	1700	-42	-14.14	2.56
184	302	183	304	261	315	-42	-14.14	2.56
169	305	182	48	4	155	-43	-91.07	8.55
164	161	156	124	77	256	-46	-37.52	4.64
306	139	142	497	447	1582	-49	-10.06	2.3
161	305	169	143	88	152	-54	-38.35	5.1
403	104	202	123	66	469	-56	-46.69	5.91
305	161	164	281	204	1514	-76	-27.25	4.91
202	104	403	201	39	548	-161	-80.46	14.76

ATCs - AM Comparison of Modelled Flows with Input Counts

ANODE	BNODE	CNODE	COUNT	MODELLED FLOW	CAPACITY	DIFFERENCE	% DIFFERENCE	GEH
172	169	0	257	379	2249	122	47.33	6.82
101	1	0	163	195	1800	32	19.61	2.39
116	115	0	91	122	1679	31	33.95	2.99
115	116	0	182	209	1700	27	14.84	1.93
1	101	0	155	173	731	18	11.85	1.43
128	17	0	222	238	1800	16	7.42	1.09
4	104	0	70	84	1333	14	20.42	1.63
118	13	u/m	64	75/73	1800	9	14.04	1.09
169	172	0	236	238	1695	2	0.67	0.1
13	118	0	103	103	1646	0	-0.02	0
17	128	0	300	300	1652	0	-0.11	0.02
15	121	0	91	91	923	0	0	0
121	15	0	161	161	1800	0	-0.03	0
402	203	0	51	50	900	0	-2.93	0.21
501	9	0	218	218	1800	0	0	0
9	501	0	118	118	1404	0	0	0
57	405	0	251	251	10000	0	0	0
134	131	0	394	390	1699	-3	-0.92	0.18
104	4	u/m	134	134/128	1800	-5	-4.48	0.52
203	402	0	101	93	10000	-7	-8.4	0.86
405	57	u/m	483	483/475	1800	-7	-1.66	0.37
131	134	0	463	418	561	-44	-9.67	2.13

SATURN AM -Model -VALIDATION

COMPARISON OF MODELLED FLOWS WITH INPUT COUNTS
FOR THE FOLLOWING LINKS OR TURNS:

NO.	ANODE	BNODE	CNODE	COUNT	MODELLED	CAPACITY	DIFFER-	%	GEH
				FLOW	ENCE	DIFF.			
COUNT SET 1 -									
1	408	134	407	6	0	1319	-5	-100.00	3.46
2	408	134	131	293	298	1700	5	1.86	0.32
3	407	134	408	2	0	41	-1	-100.00	2.00
4	407	134	131	196	198	301	2	1.05	0.15
5	131	134	408	228	190	807	-37	-16.56	2.61
6	131	134	407	155	156	263	1	0.51	0.06
7	157	154	153	273	275	568	2	0.58	0.10
8	157	154	156	32	0	125	-31	-100.00	8.00
9	153	154	156	320	319	1700	0	-0.18	0.03
10	153	154	157	290	310	499	20	6.92	1.16
11	156	154	157	62	0	1381	-61	-100.00	11.14
12	156	154	153	273	232	1700	-40	-14.87	2.55
13	151	153	155	112	5	1392	-106	-95.45	13.97
14	151	153	154	221	222	1695	1	0.23	0.03
15	154	153	151	120	104	1700	-15	-13.69	1.55
16	154	153	155	426	403	503	-22	-5.30	1.11
17	155	153	154	389	408	574	19	4.88	0.95
18	155	153	151	38	2	293	-35	-94.66	8.04
19	131	502	132	462	477	1127	15	3.18	0.68
20	131	502	404	63	64	714	1	1.12	0.09
21	132	502	131	325	326	1220	1	0.34	0.06
22	132	502	404	482	469	1362	-12	-2.78	0.61
23	404	502	131	35	35	841	0	0.02	0.00
24	404	502	132	598	598	1404	0	0.04	0.01
25	305	161	156	186	221	1412	35	18.78	2.45
26	305	161	164	237	200	1465	-36	-15.64	2.51
27	156	161	305	132 >	65	116	-66	-51.07	6.80
28	156	161	164	218	178	304	-39	-18.54	2.87
29	164	161	305	179	132	450	-46	-26.16	3.75
30	164	161	156	274 >	188	236	-85	-31.28	5.64
31	406	109	501	219	218	1193	0	-0.24	0.04
32	406	109	108	155	154	401	0	-0.56	0.07
33	501	109	406	219	220	1576	1	0.56	0.08
34	501	109	108	131	116	1393	-14	-11.24	1.32
35	108	109	406	156	201	419	45	28.97	3.38
36	108	109	501	107	107	256	0	-0.29	0.03
37	202	104	106	126	144	1477	18	14.40	1.56
38	202	104	4	52	51	1467	0	-2.20	0.16
39	202	104	403	100	28	532	-71	-71.74	8.96
40	106	104	202	142	123	409	-18	-13.30	1.64

SATURN AM -Model -VALIDATION

41	106	104	4	11	11	670	0	-2.26	0.08
42	106	104	403	103	103	418	0	0.41	0.04
43	4	104	202	128	125	1627	-2	-2.73	0.31
44	4	104	106	24	23	527	0	-3.00	0.15
45	4	104	403	10	3	1417	-6	-68.02	2.65
46	403	104	202	242	67	395	-174	-72.26	14.07
47	403	104	106	156	154	410	-1	-1.02	0.13
48	403	104	4	13	1	293	-11	-89.34	4.33
49	401	101	403	47	62	1567	15	32.97	2.09
50	401	101	1	33	35	1634	2	6.82	0.39
51	403	101	401	49	49	394	0	0.24	0.02
52	403	101	1	92	86	605	-5	-6.79	0.66
53	1	101	401	70	73	1261	3	3.67	0.30
54	1	101	403	166	160	595	-5	-3.36	0.44
55	308	139	142	255 >	231	231	-23	-9.46	1.55
56	308	139	306	150 >	134	134	-15	-10.48	1.32
57	142	139	308	147	146	326	0	-0.38	0.05
58	142	139	306	341	288	1066	-52	-15.49	2.98
59	306	139	308	119	135	1267	16	13.71	1.45
60	306	139	142	387	354	1556	-32	-8.63	1.74
61	123	122	121	1	0	635	0	-100.00	0.00
62	123	122	503	84	0	539	-83	-99.99	12.96
63	123	122	124	3	2	477	0	-31.06	0.59
64	121	122	503	35	33	1508	-1	-6.45	0.39
65	121	122	124	98	97	1665	0	-0.72	0.07
66	503	122	123	47	0	434	-46	-100.00	9.70
67	503	122	121	8	37	547	29	365.18	6.14
68	503	122	124	20	21	601	1	3.38	0.15
69	124	122	123	7	0	1463	-6	-100.00	3.74
70	124	122	121	95	90	1644	-4	-5.34	0.53
71	124	122	503	81	20	572	-60	-75.41	8.60
72	109	501	111	239	238	1496	0	-0.53	0.08
73	109	501	9	85	87	1345	2	2.86	0.26
74	111	501	109	119	119	1503	0	0.41	0.04
75	111	501	9	10	10	1394	0	3.39	0.11
76	9	501	109	222	217	1478	-4	-2.25	0.34
77	9	501	111	20	8	1269	-11	-60.35	3.23
78	167	303	304	71	51	88	-19	-28.10	2.55
79	167	303	301	268	299	340	31	11.42	1.82
80	304	303	301	453	456	653	3	0.66	0.14
81	301	303	167	135	158	472	23	17.37	1.94
82	301	303	304	438	445	671	7	1.66	0.35
83	303	304	309	91	96	719	5	5.29	0.50
84	303	304	307	399	400	822	1	0.37	0.07
85	309	304	307	286	283	513	-2	-0.88	0.15
86	309	304	303	74	74	132	0	0.61	0.05
87	307	304	303	383	382	1289	0	-0.38	0.07
88	307	304	309	284	304	702	20	6.92	1.15
89	182	305	161	40	0	44	-39	-99.88	8.93
90	182	305	204	47	29	73	-17	-38.23	2.91

SATURN AM -Model -VALIDATION

91	182	305	169	113	144	193	31	27.65	2.75
92	182	305	168	4	0	45	-3	-98.72	2.77
93	161	305	204	1	0	74	0	-100.00	0.00
94	161	305	169	147 >	69	143	-77	-53.32	7.55
95	161	305	168	164	128	211	-35	-21.88	2.97
96	161	305	182	6	0	76	-5	-99.48	3.44
97	204	305	169	11	0	25	-10	-100.00	4.69
98	204	305	168	110	148	268	38	34.48	3.34
99	204	305	182	19	18	33	0	-3.54	0.16
100	204	305	161	5	12	29	7	145.01	2.47
101	169	305	168	51	3	155	-47	-94.97	9.36
102	169	305	182	45	15	184	-29	-67.58	5.57
103	169	305	161	244	265	434	21	8.49	1.30
104	169	305	204	5	0	156	-4	-100.00	3.16
105	168	305	182	2	0	97	-1	-99.96	2.00
106	168	305	161	118	144	261	26	21.89	2.26
107	168	305	204	30	38	148	8	27.65	1.42
108	168	305	169	31	5	165	-25	-83.67	6.11
109	136	184	410	100	101	1600	1	0.70	0.07
110	184	410	185	100	101	10000	1	0.70	0.07
111	410	185	301	100	101	409	1	0.70	0.07
112	132	183	409	405	396	1750	-8	-2.17	0.44
113	183	409	184	405	396	10000	-8	-2.17	0.44
114	409	184	136	405	396	475	-8	-2.17	0.44
115	136	184	302	373	325	1700	-47	-12.81	2.56
116	184	302	183	373 >	325	352	-47	-12.81	2.56
117	132	183	302	423	450	2000	27	6.28	1.27
118	183	302	185	423	450	900	27	6.28	1.27
119	302	185	301	423	450	2000	27	6.28	1.27
120	301	185	302	460	536	3400	76	16.43	3.39
121	185	302	183	460	439	1045	-20	-4.49	0.97
122	302	183	132	734	765	1700	31	4.16	1.12
123	185	302	184	99	96	493	-2	-2.80	0.28
124	302	184	136	99	96	1700	-2	-2.80	0.28

COUNT SET 2 -

125	131	134	0	322	346	543	24	7.46	1.31
126	134	131	0	442	497	1700	55	12.33	2.52
127	13	118	0	108	115	1620	7	6.71	0.69
128	118	13	0	104	104	1800	0	-0.15	0.02
129	116	115	0	272	276	1681	4	1.43	0.24
130	115	116	0	72	121	1700	49	68.57	5.02
131	17	128	0	309	309	1608	0	0.03	0.00
132	128	17	0	222	220	1800	-1	-0.98	0.15
133	15	121	0	149	149	1176	0	0.00	0.00
134	121	15	u/m	93	93/89	1800	-3	-4.31	0.42
135	402	203	0	159	159	900	0	0.15	0.02
136	203	402	0	107	107	10000	0	-0.04	0.00
137	501	9	0	98	98	1800	0	-0.23	0.02

SATURN AM -Model -VALIDATION

138	9	501	0	225	225	1486	0	-0.03	0.00
139	104	4	u/m	63	63/61	1800	-1	-3.18	0.25
140	4	104	0	151	151	1301	0	-0.01	0.00
141	101	1	0	121	121	1800	0	0.00	0.00
142	1	101	0	233	233	774	0	-0.01	0.00
143	405	57	u/m	201	201/189	1800	-11	-5.97	0.86
144	57	405	0	614	614	10000	0	0.00	0.00
145	169	172	0	303	303	1678	0	-0.13	0.02
146	172	169	0	263	281	2206	18	6.97	1.11

WARNING: THE FLOWS ON CERTAIN LINKS ARE NOT UNAMBIGUOUSLY DEFINED DUE TO THE PRESENCE OF FLOWS TO OR FROM ZONES, BUS TERMINI, ETC. THE MODELLED FLOW ABOVE IS THE MID-LINK FLOW (m) BUT THE UPSTREAM (u) AND DOWNSTREAM (d) FLOWS ARE ALSO GIVEN; E.g. u/m/d

THERE HAVE BEEN 146 CORRECT LINK OR TURN ANALYSES REQUESTED AND 1 NON-FATAL INPUT ERRORS - ZERO FLOW DEFINED

MODELLED v COUNTS SATISFYING THE DMRB RULES:
(IN ALL 4 TESTS THE OK % SHOULD BE > 85%)

FLOW < 700: MODELLED WITHIN +-100 OF OBSERVED= 98.62% - 143 OUT OF 145

700<FLOW<2700: MODELLED WITHIN 15% OF OBSERVED= 100.00% - 1 OUT OF 1

FLOW > 2700 - NO SUCH LINKS INCLUDED

COMPLIANCE SUMMED OVER ALL FLOW RANGES = 98.63% - 144 OUT OF 146

ALL LINKS - GEH STATISTIC < 5.0 = 87.67% - 128 OUT OF 146

DMRB CRITERIA DISAGGREGATED BY COUNT SETS:

SET	FLOW < 700	700 < FLOW < 2700	FLOW > 2700	GEH	ALL FLOWS
	OK TOTAL %OK	OK TOTAL %OK	OK TOTAL %OK	OK TOTAL %OK	%OK
1	121 123 98.37	1 1 100.00	0 0 0.00	107 124 86.29	98.39
2	22 22 100.00	0 0 0.00	0 0 0.00	21 22 95.45	100.00
SUM	143 145 98.62	1 1 100.00	0 0 0.00	128 146 87.67	98.63

N.B. MORE COMPLETE STATISTICS INCLUDED ON THE LP FILE

TOTAL NUMBER OF ELEMENTS CONSIDERED 146

STATISTIC	COUNTS	MODEL FLOWS	DIFFERENCE
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SATURN AM -Model -VALIDATION

NUMBER OF NEGATIVES	0	0	
NUMBER OF ZEROS	0	10	
SUM OF ELEMENTS	25839.	24816.	1023.
AVERAGE ELEMENT	176.98	169.97	7.01
STANDARD DEVIATION	150.02	156.58	-6.57
COEFFICIENT OF VARIATION	0.8477	0.9212	-0.0736

REGRESSION OF MODEL FLOWS ELEMENTS (Y) AGAINST COUNTS (X)

EQUATION	A	B	R-SQUARED
Y = A + BX	-11.365	1.025	0.9636
STANDARD ERRORS -	5.680	0.024	
Y = BX		0.987	0.9614
Y = X			0.9611

AVERAGE ABSOLUTE DIFFERENCE = 18.02
 RELATIVE TO THE AVERAGE COUNTS ELEMENT = 10.18 PER CENT

RANGE OF DIFFERENCES: -174.88 TO 75.57
 TOTAL RANGE = 250.44

STANDARD DEVIATION OF DIFFERENCES = 30.89
 RELATIVE TO THE AVERAGE COUNTS ELEMENT = 17.46 PER CENT

SATURN PM -Model -VALIDATION

COMPARISON OF MODELLED FLOWS WITH INPUT COUNTS
FOR THE FOLLOWING LINKS OR TURNS:

NO.	ANODE	BNODE	CNODE	COUNT FLOW	MODELLED FLOW	CAPACITY DIFF.	DIFFER- ENCE	%	GEH
COUNT SET 1 -									
1	408	134	407	29	0	1349	-28	-100.00	7.62
2	408	134	131	295	267	1700	-27	-9.62	1.69
3	407	134	408	4	0	65	-3	-100.00	2.83
4	407	134	131	123	124	328	1	0.61	0.07
5	131	134	408	209	219	653	10	4.94	0.71
6	131	134	407	228	199	281	-28	-12.76	1.99
7	157	154	153	313	331	572	18	5.85	1.02
8	157	154	156	26	0	120	-25	-99.96	7.21
9	153	154	156	205	179	1700	-25	-12.80	1.89
10	153	154	157	300	299	503	0	-0.21	0.04
11	156	154	157	30	0	1388	-29	-100.00	7.75
12	156	154	153	226	226	1700	0	-0.18	0.03
13	151	153	155	38	2	1527	-35	-94.68	8.04
14	151	153	154	100	77	1698	-22	-22.75	2.42
15	154	153	151	165	164	1700	0	-0.89	0.11
16	154	153	155	374	393	575	19	5.17	0.99
17	155	153	154	405	401	655	-3	-1.01	0.20
18	155	153	151	38	4	325	-33	-89.43	7.41
19	131	502	132	413	399	1231	-13	-3.49	0.72
20	131	502	404	30	30	863	0	-0.23	0.01
21	132	502	131	406	425	1241	19	4.57	0.91
22	132	502	404	467	480	1296	13	2.79	0.60
23	404	502	131	72	43	828	-28	-40.20	3.82
24	404	502	132	530	520	1305	-9	-1.89	0.44
25	305	161	156	176	175	1408	0	-0.62	0.08
26	305	161	164	281	204	1514	-76	-27.25	4.91
27	156	161	305	115	84	126	-30	-26.78	3.09
28	156	161	164	244	212	294	-31	-12.98	2.10
29	164	161	305	143	151	1231	8	5.74	0.68
30	164	161	156	124	77	256	-46	-37.52	4.64
31	406	109	501	198	194	1217	-3	-1.83	0.26
32	406	109	108	130	149	410	19	14.60	1.61
33	501	109	406	201	206	1568	5	2.63	0.37
34	501	109	108	123	124	1406	1	0.68	0.08
35	108	109	406	101	93	426	-7	-7.45	0.76
36	108	109	501	140	111	345	-28	-20.99	2.62
37	202	104	106	131	110	1394	-20	-15.96	1.90
38	202	104	4	116	114	1478	-1	-2.11	0.23
39	202	104	403	201	39	548	-161	-80.46	14.76
40	106	104	202	126	136	376	10	7.97	0.88

SATURN PM -Model -VALIDATION

41	106	104	4	17	13	633	-3	-26.26	1.16
42	106	104	403	135	147	404	12	9.26	1.05
43	4	104	202	65	63	1656	-1	-2.55	0.21
44	4	104	106	11	11	532	0	0.09	0.00
45	4	104	403	18	10	1509	-7	-44.74	2.15
46	403	104	202	123	66	469	-56	-46.69	5.91
47	403	104	106	110	111	418	1	0.48	0.05
48	403	104	4	10	8	342	-1	-20.91	0.70
49	401	101	403	56	56	1537	0	0.00	0.00
50	401	101	1	67	67	1641	0	-0.62	0.05
51	403	101	401	56	68	374	12	22.02	1.56
52	403	101	1	130	128	564	-1	-1.25	0.14
53	1	101	401	57	45	1342	-11	-20.43	1.63
54	1	101	403	128	128	592	0	0.01	0.00
55	308	139	142	150	145	247	-4	-3.59	0.44
56	308	139	306	98	101	167	3	3.17	0.31
57	142	139	308	129	140	307	11	8.72	0.97
58	142	139	306	292	258	1042	-33	-11.60	2.04
59	306	139	308	115	112	1179	-2	-3.03	0.33
60	306	139	142	497	447	1582	-49	-10.06	2.30
61	123	122	121	1	0	550	0	-100.00	0.00
62	123	122	503	41	25	516	-15	-39.13	2.79
63	123	122	124	17	34	455	17	101.10	3.40
64	121	122	123	1	0	528	0	-100.00	0.00
65	121	122	503	11	0	1529	-10	-100.00	4.69
66	121	122	124	77	75	1700	-1	-2.15	0.19
67	503	122	123	10	0	447	-9	-100.00	4.47
68	503	122	121	9	22	548	13	142.59	3.27
69	503	122	124	8	8	622	0	0.05	0.00
70	124	122	123	6	0	1445	-5	-100.00	3.46
71	124	122	121	128	125	1660	-2	-2.71	0.31
72	124	122	503	16	15	587	0	-6.25	0.25
73	109	501	111	97	96	1378	0	-0.98	0.10
74	109	501	9	216	209	1491	-6	-3.26	0.48
75	111	501	109	199	215	1400	16	8.12	1.12
76	111	501	9	16	9	1194	-6	-43.46	1.96
77	9	501	109	114	115	1401	1	0.86	0.09
78	9	501	111	3	3	1289	0	0.55	0.01
79	167	303	304	59	58	120	0	-0.90	0.07
80	167	303	301	185	235	306	50	27.29	3.48
81	304	303	301	494	459	672	-34	-7.02	1.59
82	301	303	167	150	134	482	-15	-10.64	1.34
83	301	303	304	434	448	706	14	3.16	0.65
84	303	304	309	70	90	622	20	28.59	2.24
85	303	304	307	420	416	711	-3	-0.91	0.19
86	309	304	307	330	330	605	0	0.00	0.00
87	309	304	303	82	87	151	5	5.79	0.52
88	307	304	303	384	373	1267	-10	-2.97	0.59
89	307	304	309	319	348	692	29	9.08	1.59
90	182	305	161	11	0	40	-10	-99.54	4.66

SATURN PM -Model -VALIDATION

91	182	305	204	67	75	114	8	11.55	0.92
92	182	305	169	42	43	87	1	2.89	0.19
93	182	305	168	2	0	41	-1	-99.66	1.99
94	161	305	204	2	0	64	-1	-100.00	2.00
95	161	305	169	143	88	152	-54	-38.35	5.10
96	161	305	168	96	147	219	51	53.38	4.65
97	161	305	182	4	0	66	-3	-100.00	2.83
98	204	305	169	11	0	0	-10	-100.00	4.69
99	204	305	168	68	79	162	11	16.30	1.29
100	204	305	182	13 >	5	10	-7	-61.43	2.66
101	204	305	161	8	0	0	-7	-100.00	4.00
102	169	305	168	28	50	186	22	79.26	3.55
103	169	305	182	48	4	155	-43	-91.07	8.55
104	169	305	161	277	276	427	0	-0.29	0.05
105	169	305	204	9	0	139	-8	-100.00	4.24
106	168	305	182	5	0	0	-4	-99.99	3.16
107	168	305	161	107	103	120	-3	-3.63	0.38
108	168	305	204	77 >	51	66	-25	-33.78	3.25
109	168	305	169	31 >	0	1	-30	-99.64	7.83
110	136	184	410	91	97	1600	6	6.79	0.64
111	184	410	185	91	97	10000	6	6.79	0.64
112	410	185	301	91	97	411	6	6.79	0.64
113	132	183	409	456	451	1750	-4	-1.19	0.25
114	183	409	184	456	451	10000	-4	-1.19	0.25
115	409	184	136	456	451	462	-4	-1.19	0.25
116	136	184	302	304	261	1700	-42	-14.14	2.56
117	184	302	183	304	261	315	-42	-14.14	2.56
118	132	183	302	446	444	2000	-1	-0.49	0.10
119	183	302	185	446	444	880	-1	-0.49	0.10
120	302	185	301	446	444	2000	-1	-0.49	0.10
121	301	185	302	676	696	3400	20	2.98	0.77
122	185	302	183	541	591	1083	50	9.25	2.10
123	302	183	132	745	852	1700	107	14.37	3.79
124	185	302	184	135	105	535	-29	-22.18	2.73
125	302	184	136	135	105	1700	-29	-22.18	2.73

COUNT SET 2 -

126	131	134	0	463	418	561	-44	-9.67	2.13
127	134	131	0	394	390	1699	-3	-0.92	0.18
128	13	118	0	103	103	1646	0	-0.02	0.00
129	118	13	u/m	64	75/73	1800	9	14.04	1.09
130	116	115	0	91	122	1679	31	33.95	2.99
131	115	116	0	182	209	1700	27	14.84	1.93
132	17	128	0	300	300	1652	0	-0.11	0.02
133	128	17	0	222	238	1800	16	7.42	1.09
134	15	121	0	91	91	923	0	0.00	0.00
135	121	15	0	161	161	1800	0	-0.03	0.00
136	402	203	0	51	50	900	0	-2.93	0.21
137	203	402	0	101	93	10000	-7	-8.40	0.86

SATURN PM -Model -VALIDATION

138	501	9	0	218	218	1800	0	0.00	0.00
139	9	501	0	118	118	1404	0	0.00	0.00
140	104	4	u/m	134	134/128	1800	-5	-4.48	0.52
141	4	104	0	70	84	1333	14	20.42	1.63
142	101	1	0	163	195	1800	32	19.61	2.39
143	1	101	0	155	173	731	18	11.85	1.43
144	405	57	u/m	483	483/475	1800	-7	-1.66	0.37
145	57	405	0	251	251	10000	0	0.00	0.00
146	169	172	0	236	238	1695	2	0.67	0.10
147	172	169	0	257	379	2249	122	47.33	6.82

WARNING: THE FLOWS ON CERTAIN LINKS ARE NOT UNAMBIGUOUSLY DEFINED DUE TO THE PRESENCE OF FLOWS TO OR FROM ZONES, BUS TERMINI, ETC. THE MODELLED FLOW ABOVE IS THE MID-LINK FLOW (m) BUT THE UPSTREAM (u) AND DOWNSTREAM (d) FLOWS ARE ALSO GIVEN; E.g. u/m/d

THERE HAVE BEEN 147 CORRECT LINK OR TURN ANALYSES REQUESTED AND 0 NON-FATAL INPUT ERRORS - ZERO FLOW DEFINED

MODELLED v COUNTS SATISFYING THE DMRB RULES:
(IN ALL 4 TESTS THE OK % SHOULD BE > 85%)

FLOW < 700: MODELLED WITHIN +-100 OF OBSERVED= 98.63% - 144 OUT OF 146

700<FLOW<2700: MODELLED WITHIN 15% OF OBSERVED= 100.00% - 1 OUT OF 1

FLOW > 2700 - NO SUCH LINKS INCLUDED

COMPLIANCE SUMMED OVER ALL FLOW RANGES = 98.64% - 145 OUT OF 147

ALL LINKS - GEH STATISTIC < 5.0 = 92.52% - 136 OUT OF 147

DMRB CRITERIA DISAGGREGATED BY COUNT SETS:

SET	FLOW < 700	700 < FLOW < 2700	FLOW > 2700	GEH	ALL FLOWS
OK	TOTAL	%OK	OK	TOTAL	%OK

1	123	124	99.19	1	1	100.00	0	0	0.00	115	125	92.00	99.20
2	21	22	95.45	0	0	0.00	0	0	0.00	21	22	95.45	95.45

SUM	144	146	98.63	1	1	100.00	0	0	0.00	136	147	92.52	98.64
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N.B. MORE COMPLETE STATISTICS INCLUDED ON THE LP FILE

TOTAL NUMBER OF ELEMENTS CONSIDERED 147

SATURN PM -Model -VALIDATION

STATISTIC	COUNTS	MODEL FLOWS	DIFFERENCE
NUMBER OF NEGATIVES	0	0	
NUMBER OF ZEROS	0	12	
SUM OF ELEMENTS	24913.	24290.	623.
AVERAGE ELEMENT	169.48	165.24	4.24
STANDARD DEVIATION	157.16	162.66	-5.50
COEFFICIENT OF VARIATION	0.9273	0.9844	-0.0571

REGRESSION OF MODEL FLOWS ELEMENTS (Y) AGAINST COUNTS (X)

EQUATION	A	B	R-SQUARED
Y = A + BX	-7.677	1.020	0.9718
STANDARD ERRORS -	4.759	0.021	
Y = BX		0.996	0.9707
Y = X			0.9707

AVERAGE ABSOLUTE DIFFERENCE = 16.33
 RELATIVE TO THE AVERAGE COUNTS ELEMENT = 9.64 PER CENT

RANGE OF DIFFERENCES: -161.73 TO 121.64
 TOTAL RANGE = 283.37

STANDARD DEVIATION OF DIFFERENCES = 27.84
 RELATIVE TO THE AVERAGE COUNTS ELEMENT = 16.43 PER CENT