

Appendix for New Large-Scale Data Instances for CARP and New Variations of CARP

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Data instances for the SP-CARP

This appendix provides information on the data for SP-CARP. Tables 1 and 2 hold information about the graphs for the problem. Columns 2 and 3 state the number of nodes and edges in the graphs, and column 4 states the number of different collection intervals. The next part of the tables provides the number of edges requiring collection three times a week ($\pi^{\frac{1}{3}}$), twice a week ($\pi^{\frac{1}{2}}$), weekly (π^1), and every two weeks (π^2), every third week (π^3), every fourth week (π^4), and every eight week (π^8). The second last column gives the average number of collection intervals per edge ($\bar{\pi}$). Finally, the last column states the household combinations used for the demand in the graphs.

Tables 3 and 4 provide the ids of the three vehicle files assigned to each SP-CARP graph as well as the longest collection interval and the time horizon of the graphs, both measured in days.

	$ N $	$ E $	$ \mathcal{H} $	$\pi^{\frac{1}{3}}$	$\pi^{\frac{1}{2}}$	π^1	π^2	π^3	π^4	π^8	$\bar{\pi}$	HT
SP-CARP_F1_g	812	1124	7	125	421	552	115	14	715	251	2.8	AR
SP-CARP_F1_p	795	1106	3	0	0	53	529	0	0	303	1.2	AR
SP-CARP_F6_g	531	780	5	0	10	283	1	0	268	212	2.6	R
SP-CARP_F6_p	502	741	2	0	0	0	23	0	0	266	1	R
SP-CARP_F9_g	788	1096	7	125	419	442	115	14	624	122	2.7	A
SP-CARP_F9_p	770	1077	3	0	0	53	528	0	0	179	1.2	A
SP-CARP_F10_g	415	565	7	60	146	270	52	11	334	160	2.7	AR
SP-CARP_F11_g	191	267	7	22	68	118	24	5	155	79	2.7	AR
SP-CARP_F12_g	80	110	6	6	26	56	4	0	64	37	2.7	AR
SP-CARP_F13_g	26	33	5	0	9	16	2	0	17	10	2.8	AR
SP-CARP_F14_g	399	549	7	78	262	273	64	4	370	89	2.9	AR
SP-CARP_F15_g	198	265	7	42	138	122	38	2	180	23	2.8	AR
SP-CARP_F16_g	82	106	7	19	49	38	13	1	66	5	2.5	AR
SP-CARP_F17_g	28	35	5	9	13	10	4	0	20	0	2.2	AR
SP-CARP_K1_g	11640	12675	4	5	56	903	8225	0	0	0	1.1	ARS
SP-CARP_K1_p	8382	9295	2	0	0	0	0	0	3450	1951	1	ARS
SP-CARP_K2_g	11636	12671	5	5	56	826	7930	0	541	0	1.1	ARs
SP-CARP_K3_g	11072	12081	2	0	0	450	8013	0	0	0	1	RS
SP-CARP_K4_g	11068	12077	3	0	0	373	7717	0	541	0	1.1	Rs
SP-CARP_K5_g	11405	12435	4	5	56	826	7930	0	0	0	1.1	AR
SP-CARP_K6_g	10832	11835	2	0	0	373	7717	0	0	0	1	R
SP-CARP_K6_p	7983	8882	2	0	0	0	0	0	3223	1867	1	R
SP-CARP_K7_g	1193	1499	2	0	0	79	526	0	0	0	1.1	S
SP-CARP_K9_g	2773	3472	4	5	56	485	529	0	0	0	1.1	A
SP-CARP_K9_p	1735	2226	2	0	0	0	0	0	399	110	1	A
SP-CARP_K10_g	5095	5511	4	1	25	503	3510	0	0	0	1.1	ARS
SP-CARP_K11_g	3111	3358	4	1	11	311	2145	0	0	0	1.1	ARS
SP-CARP_K12_g	1131	1220	2	0	0	40	790	0	0	0	1	ARS
SP-CARP_K13_g	393	421	2	0	0	17	279	0	0	0	1	ARS
SP-CARP_K14_g	6255	6824	4	4	52	539	4491	0	0	0	1.1	ARS
SP-CARP_K15_g	3176	3505	4	3	28	211	2360	0	0	0	1.1	ARS
SP-CARP_K16_g	1323	1470	4	3	17	95	980	0	0	0	1.1	ARS
SP-CARP_K17_g	375	412	2	0	0	11	284	0	0	0	1	ARS

Table 1: SP-CARP graphs for sets F and K.

	$ N $	$ E $	$ \mathcal{H} $	$\pi^{\frac{1}{3}}$	$\pi^{\frac{1}{2}}$	π^1	π^2	π^3	π^4	π^8	$\bar{\pi}$	HT
SP-CARP_N1_g	8537	9725	3	0	7	3171	5243	0	0	0	1.3	ARS
SP-CARP_N1_p	6980	8041	3	0	0	1	14	0	4828	0	1	ARS
SP-CARP_N2_g	8537	9725	3	0	7	2817	5532	0	0	0	1.3	ARs
SP-CARP_N3_g	8257	9429	2	0	0	2898	5141	0	0	0	1.3	RS
SP-CARP_N4_g	8257	9429	2	0	0	2543	5430	0	0	0	1.3	Rs
SP-CARP_N5_g	8444	9631	3	0	7	2817	5242	0	0	0	1.3	AR
SP-CARP_N6_g	8164	9335	2	0	0	2543	5140	0	0	0	1.3	R
SP-CARP_N7_g	1587	1950	2	0	0	784	1	0	0	0	1	S
SP-CARP_N9_g	2018	2655	3	0	7	396	241	0	0	0	1.1	A
SP-CARP_N9_p	1743	2296	3	0	0	1	14	0	485	0	1	A
SP-CARP_N10_g	3686	4175	3	0	1	1275	2351	0	0	0	1.3	ARS
SP-CARP_N11_g	2134	2411	3	0	1	594	1434	0	0	0	1.3	ARS
SP-CARP_N12_g	925	1035	3	0	1	281	628	0	0	0	1.3	ARS
SP-CARP_N13_g	451	499	2	0	0	144	331	0	0	0	1.3	ARS
SP-CARP_N14_g	4091	4656	3	0	6	1566	2453	0	0	0	1.3	ARS
SP-CARP_N15_g	2171	2459	3	0	4	1061	1284	0	0	0	1.4	ARS
SP-CARP_N16_g	915	1030	3	0	4	556	575	0	0	0	1.5	ARS
SP-CARP_N17_g	268	305	3	0	2	173	152	0	0	0	1.5	ARS
SP-CARP_O1_g	10283	11863	3	0	10	238	8414	0	0	0	1	AR
SP-CARP_O1_p	9957	11492	2	0	0	0	272	0	8097	0	1	AR
SP-CARP_O6_p	9247	10719	2	0	0	0	24	0	7510	0	1	R
SP-CARP_O9_g	4362	5628	3	0	10	238	1863	0	0	0	1	A
SP-CARP_O9_p	4018	5238	2	0	0	0	271	0	1631	0	1.1	A
SP-CARP_O10_g	5149	6159	3	0	10	185	4321	0	0	0	1	AR
SP-CARP_O11_g	2031	2650	3	0	8	73	1873	0	0	0	1	AR
SP-CARP_O12_g	942	1263	3	0	8	34	958	0	0	0	1	AR
SP-CARP_O13_g	351	451	3	0	6	15	315	0	0	0	1.1	AR
SP-CARP_O14_g	5847	6941	3	0	9	172	4670	0	0	0	1	AR
SP-CARP_O15_g	2805	3263	2	0	0	74	2051	0	0	0	1	AR
SP-CARP_O16_g	761	852	2	0	0	9	528	0	0	0	1	AR
SP-CARP_O17_g	228	247	2	0	0	3	168	0	0	0	1	AR
SP-CARP_S1_g	6149	7110	3	0	5	2654	2796	0	0	0	1.4	ARS
SP-CARP_S1_p	3879	4607	3	0	0	4	8	0	1886	0	1	ARS
SP-CARP_S2_g	6149	7110	3	0	5	2504	3045	0	0	0	1.5	ARs
SP-CARP_S3_g	5957	6896	2	0	0	2550	2766	0	0	0	1.4	RS
SP-CARP_S4_g	5957	6896	2	0	0	2398	3016	0	0	0	1.5	Rs
SP-CARP_S5_g	6104	7063	3	0	5	2504	2796	0	0	0	1.4	AR
SP-CARP_S6_g	5909	6846	2	0	0	2398	2766	0	0	0	1.4	R
SP-CARP_S6_p	3667	4366	2	0	0	0	1	0	1787	0	1	R
SP-CARP_S7_g	2099	2591	2	0	0	864	1	0	0	0	1	S
SP-CARP_S9_g	1094	1447	3	0	5	174	63	0	0	0	1.1	A
SP-CARP_S9_p	782	1030	3	0	0	4	7	0	157	0	1	A
SP-CARP_S10_g	3404	3921	3	0	4	1586	1621	0	0	0	1.4	ARS
SP-CARP_S11_g	1564	1805	3	0	1	619	690	0	0	0	1.4	ARS
SP-CARP_S12_g	755	866	3	0	1	241	276	0	0	0	1.3	ARS
SP-CARP_S13_g	322	374	2	0	0	93	125	0	0	0	1.2	ARS
SP-CARP_S14_g	3072	3557	3	0	4	1420	1429	0	0	0	1.5	ARS
SP-CARP_S15_g	1605	1853	3	0	3	772	768	0	0	0	1.5	ARS
SP-CARP_S16_g	542	616	2	0	0	266	277	0	0	0	1.4	ARS
SP-CARP_S17_g	342	388	2	0	0	170	170	0	0	0	1.4	ARS

Table 2: SP-CARP graphs for sets N, O, and S.

	Vehicle files			Largest interval, days	Time horizon, days
SP-CARP_F1_g	6-24	5-24	4-24	56	168
SP-CARP_F1_p	6-8	4-8	2-8	56	56
SP-CARP_F6_g	6-8	4-8	2-8	56	56
SP-CARP_F6_p	3-8	2-8	1-8	56	56
SP-CARP_F9_g	6-24	5-24	4-24	56	168
SP-CARP_F9_p	5-8	4-8	1-8	56	56
SP-CARP_F10_g	6-24	5-24	4-24	56	168
SP-CARP_F11_g	6-24	4-24	2-24	56	168
SP-CARP_F12_g	6-8	4-8	2-8	56	56
SP-CARP_F13_g	4-8	3-8	2-8	56	56
SP-CARP_F14_g	6-24	5-24	4-24	56	168
SP-CARP_F15_g	6-24	5-24	4-24	56	168
SP-CARP_F16_g	6-24	5-24	4-24	56	168
SP-CARP_F17_g	5-4	3-4	2-4	28	28
SP-CARP_K1_g	6-2	5-2	2-2	14	14
SP-CARP_K1_p	3-8	2-8	1-8	56	56
SP-CARP_K2_g	3-4	4-4	2-4	28	28
SP-CARP_K3_g	3-2	4-2	2-2	14	14
SP-CARP_K4_g	6-4	4-4	3-4	28	28
SP-CARP_K5_g	6-2	4-2	2-2	14	14
SP-CARP_K6_g	5-2	3-2	1-2	14	14
SP-CARP_K6_p	3-8	2-8	1-8	56	56
SP-CARP_K7_g	5-2	2-2	1-2	14	14
SP-CARP_K9_g	5-2	4-2	2-2	14	14
SP-CARP_K9_p	3-8	2-8	1-8	56	56
SP-CARP_K10_g	6-2	4-2	2-2	14	14
SP-CARP_K11_g	6-2	4-2	3-2	14	14
SP-CARP_K12_g	4-2	2-2	1-2	14	14
SP-CARP_K13_g	3-2	2-2	1-2	14	14
SP-CARP_K14_g	5-2	3-2	2-2	14	14
SP-CARP_K15_g	5-2	3-2	1-2	14	14
SP-CARP_K16_g	6-2	4-2	1-2	14	14
SP-CARP_K17_g	3-2	2-2	1-2	14	14

Table 3: SP-CARP vehicle information for sets F and K.

	Vehicle files	Largest interval, days	Time horizon, days
SP-CARP_N1_g	6-2 3-2 2-2	14	14
SP-CARP_N1_p	5-4 3-4 1-4	28	28
SP-CARP_N2_g	5-2 4-2 3-2	14	14
SP-CARP_N3_g	3-2 2-2 1-2	14	14
SP-CARP_N4_g	6-2 4-2 1-2	14	14
SP-CARP_N5_g	5-2 4-2 2-2	14	14
SP-CARP_N6_g	5-2 4-2 3-2	14	14
SP-CARP_N7_g	3-2 2-2 1-2	14	14
SP-CARP_N9_g	6-2 3-2 2-2	14	14
SP-CARP_N9_p	5-4 2-4 1-4	28	28
SP-CARP_N10_g	5-2 2-2 1-2	14	14
SP-CARP_N11_g	4-2 2-2 1-2	14	14
SP-CARP_N12_g	6-2 2-2 1-2	14	14
SP-CARP_N13_g	6-2 3-2 1-2	14	14
SP-CARP_N14_g	6-2 4-2 2-2	14	14
SP-CARP_N15_g	5-2 3-2 1-2	14	14
SP-CARP_N16_g	6-2 4-2 1-2	14	14
SP-CARP_N17_g	5-2 3-2 1-2	14	14
SP-CARP_O1_g	6-2 5-2 4-2	14	14
SP-CARP_O1_p	4-4 3-4 2-4	28	28
SP-CARP_O6_p	3-4 2-4 1-4	28	28
SP-CARP_O9_g	6-2 5-2 2-2	14	14
SP-CARP_O9_p	6-4 3-4 1-4	28	28
SP-CARP_O10_g	6-2 5-2 3-2	14	14
SP-CARP_O11_g	6-2 4-2 3-2	14	14
SP-CARP_O12_g	6-2 2-2 1-2	14	14
SP-CARP_O13_g	5-2 2-2 1-2	14	14
SP-CARP_O14_g	6-2 4-2 2-2	14	14
SP-CARP_O15_g	6-2 5-2 2-2	14	14
SP-CARP_O16_g	6-2 4-2 2-2	14	14
SP-CARP_O17_g	5-2 3-2 2-2	14	14
SP-CARP_S1_g	6-2 5-2 1-2	14	14
SP-CARP_S1_p	4-4 2-4 1-4	28	28
SP-CARP_S2_g	6-2 2-2 1-2	14	14
SP-CARP_S3_g	5-2 3-2 1-2	14	14
SP-CARP_S4_g	6-2 2-2 1-2	14	14
SP-CARP_S5_g	6-2 3-2 2-2	14	14
SP-CARP_S6_g	6-2 4-2 2-2	14	14
SP-CARP_S6_p	3-4 2-4 1-4	28	28
SP-CARP_S7_g	4-2 2-2 1-2	14	14
SP-CARP_S9_g	4-2 2-2 1-2	14	14
SP-CARP_S9_p	3-4 2-4 1-4	28	28
SP-CARP_S10_g	6-2 4-2 1-2	14	14
SP-CARP_S11_g	5-2 3-2 2-2	14	14
SP-CARP_S12_g	5-2 3-2 1-2	14	14
SP-CARP_S13_g	3-2 2-2 1-2	14	14
SP-CARP_S14_g	5-2 3-2 1-2	14	14
SP-CARP_S15_g	6-2 3-2 2-2	14	14
SP-CARP_S16_g	5-2 2-2 1-2	14	14
SP-CARP_S17_g	3-2 2-2 1-2	14	14

Table 4: SP-CARP vehicle information for sets N, O, and S.