

Supplementary Material for the article:

Vehicle routing strategies for pick-up and delivery service under two dimensional loading constraints

Table A.1. Computational Results obtained for the 2|O|SPD configuration of the 2L-SPD model

Instance	PD Class 0					PD Class 1					PD Class 2				
	<i>bst</i>	<i>v</i>	<i>t</i>	<i>avg</i>	<i>%g</i>	<i>bst</i>	<i>v</i>	<i>t</i>	<i>avg</i>	<i>%g</i>	<i>bst</i>	<i>v</i>	<i>t</i>	<i>avg</i>	<i>%g</i>
50-C-0	1330.59	13	482	1330.59	0.00	1109.45	11	728	1109.45	0.00	866.13	8	259	866.13	0.00
70-C-0	1246.88	18	883	1246.88	0.00	1009.11	14	2584	1013.45	0.43	825.65	11	3155	825.65	0.00
90-C-0	2174.28	23	1145	2184.98	0.49	1815.42	19	1421	1833.15	0.98	1448.17	14	4478	1450.08	0.13
110-C-0	2118.63	28	5220	2120.33	0.08	1790.79	22	9502	1796.75	0.33	1414.11	17	1777	1415.34	0.09
130-C-0	2986.24	33	2860	3016.29	1.01	2464.37	27	5001	2477.73	0.54	2026.10	21	5082	2037.98	0.59
150-C-0	3159.15	37	4092	3190.87	1.00	2559.84	31	5381	2568.70	0.35	2090.74	23	9842	2117.79	1.29
50-C-1	1335.33	13	453	1337.38	0.15	1075.86	10	616	1076.29	0.04	953.44	8	316	953.95	0.05
70-C-1	1129.34	17	592	1129.34	0.00	1045.91	14	140	1052.42	0.62	798.50	10	277	798.75	0.03
90-C-1	2048.41	22	553	2094.42	2.25	1700.36	18	751	1713.48	0.77	1358.91	14	1094	1370.06	0.82
110-C-1	2000.32	27	1216	2005.53	0.26	1687.24	21	936	1696.16	0.53	1350.87	16	1203	1363.35	0.92
130-C-1	2829.87	31	1332	2848.30	0.65	2307.73	25	1106	2337.65	1.30	1903.54	19	1769	1919.26	0.83
150-C-1	3072.81	37	1774	3085.81	0.42	2477.77	29	801	2498.71	0.84	2038.26	23	2457	2056.48	0.89
50-C-2	2082.88	21	74	2082.88	0.00	1924.55	19	33	1924.55	0.00	1519.79	13	40	1519.79	0.00
70-C-2	1901.28	30	656	1906.98	0.30	1503.35	21	321	1503.38	0.00	1408.05	20	157	1408.99	0.07
90-C-2	3414.60	37	653	3440.22	0.75	2739.99	31	341	2741.87	0.07	2428.83	22	567	2437.36	0.35
110-C-2	3911.04	51	1158	3943.32	0.83	3192.88	40	301	3235.56	1.34	2460.56	30	146	2486.82	1.07
130-C-2	4694.43	54	508	4710.12	0.33	4221.98	45	222	4250.56	0.68	3212.07	33	631	3227.92	0.49
150-C-2	4839.35	60	955	4900.14	1.26	4065.44	49	311	4106.72	1.02	3348.80	35	623	3369.60	0.62
50-R-0	1327.00	13	1696	1327.00	0.00	1168.89	11	529	1169.31	0.04	985.69	8	590	985.69	0.00
70-R-0	1752.93	18	1965	1754.01	0.06	1459.94	14	6564	1464.65	0.32	1240.36	11	7448	1243.97	0.29
90-R-0	2212.39	24	4864	2218.78	0.29	1897.65	19	3717	1905.89	0.43	1525.79	14	5970	1528.03	0.15
110-R-0	2668.42	28	1929	2674.62	0.23	2224.44	22	6364	2233.14	0.39	1907.41	17	12297	1918.99	0.61
130-R-0	3097.20	33	2807	3112.27	0.49	2628.33	27	5349	2637.66	0.35	2172.94	21	6605	2185.03	0.56
150-R-0	3334.11	38	5327	3351.86	0.53	2929.38	32	4897	2940.13	0.37	2362.34	23	14258	2385.89	1.00
50-R-1	1353.87	13	864	1354.59	0.05	1131.04	10	1069	1132.48	0.13	1013.06	8	218	1013.33	0.03
70-R-1	1652.98	17	587	1663.34	0.63	1464.43	14	363	1468.57	0.28	1211.17	10	1318	1217.19	0.50
90-R-1	2131.03	22	852	2142.82	0.55	1808.40	18	1349	1819.11	0.59	1496.78	14	1607	1504.39	0.51
110-R-1	2546.56	27	950	2557.92	0.45	2143.16	21	1885	2157.39	0.66	1850.81	17	1634	1862.59	0.64
130-R-1	2959.86	31	1463	2974.50	0.49	2490.17	25	475	2510.11	0.80	2097.36	19	749	2125.37	1.34
150-R-1	3303.68	37	1073	3322.21	0.56	2759.18	29	1431	2785.81	0.97	2284.27	23	2551	2304.01	0.86
50-R-2	2064.70	21	64	2064.70	0.00	1949.38	19	24	1949.38	0.00	1513.57	13	106	1513.99	0.03
70-R-2	2708.03	31	422	2708.59	0.02	2303.87	22	420	2306.62	0.12	2035.28	20	276	2036.50	0.06
90-R-2	3310.68	37	543	3317.52	0.21	2758.76	30	446	2762.21	0.13	2408.99	22	482	2421.65	0.53
110-R-2	4519.14	52	1257	4531.38	0.27	3838.50	42	208	3858.16	0.51	3132.07	28	511	3148.05	0.51
130-R-2	4915.10	55	814	4937.64	0.46	4288.15	47	831	4322.00	0.79	3411.77	33	258	3435.07	0.68
150-R-2	5334.60	59	769	5378.26	0.82	4323.69	48	859	4354.10	0.70	3669.59	36	765	3685.18	0.42
<i>average</i>				<i>0.44</i>					<i>0.48</i>					<i>0.47</i>	

bst: The best solution cost obtained over the ten runs, *v*: The number of routes contained in the best solution obtained over the ten runs
t: The average CPU time (in seconds) elapsed when the best solutions of the ten runs were obtained, *avg*: The average solution cost over the ten runs
%g: The average gap between the best and average solution cost obtained over the ten runs (= $100 \cdot (\text{avg} - \text{bst}) / \text{bst}$).

Table A.2. Computational Results obtained for the 2|R|SPD configuration of the 2L-SPD model

Instance	PD Class 0					PD Class 1					PD Class 2				
	bst	v	t	avg	%g	bst	v	t	avg	%g	bst	v	t	avg	%g
50-C-0	1302.82	12	696	1303.25	0.03	1068.64	10	811	1090.81	2.07	854.97	8	3378	858.83	0.45
70-C-0	1197.56	17	2390	1202.83	0.44	985.08	14	922	996.52	1.16	821.93	10	3265	831.21	1.13
90-C-0	2132.25	22	1423	2144.39	0.57	1772.99	19	1182	1792.90	1.12	1413.70	14	5008	1415.92	0.16
110-C-0	2082.88	27	3936	2084.13	0.06	1712.58	22	6483	1731.95	1.13	1360.48	17	4351	1396.82	2.67
130-C-0	2923.99	33	894	2934.76	0.37	2408.91	26	1353	2426.89	0.75	1933.31	20	7001	1939.41	0.32
150-C-0	3070.63	36	6850	3083.21	0.41	2465.75	30	2606	2498.52	1.33	2045.16	23	1139	2056.07	0.53
50-C-1	1324.94	13	68	1325.98	0.08	1066.90	10	305	1067.81	0.09	952.91	8	83	952.91	0.00
70-C-1	1121.23	16	389	1122.51	0.11	1031.04	14	66	1034.46	0.33	787.06	10	386	789.29	0.28
90-C-1	2021.86	22	553	2030.80	0.44	1681.54	18	596	1688.96	0.44	1323.20	13	126	1324.98	0.13
110-C-1	1946.81	26	316	1978.24	1.61	1668.01	21	298	1672.03	0.24	1309.01	16	651	1316.12	0.54
130-C-1	2748.53	30	295	2783.06	1.26	2262.12	24	445	2293.88	1.40	1854.22	19	1152	1877.58	1.26
150-C-1	2983.82	35	706	3025.82	1.41	2437.43	29	256	2444.89	0.31	1996.47	22	1328	2021.89	1.27
50-C-2	2000.15	20	37	2000.15	0.00	1913.71	18	175	1913.77	0.00	1515.00	13	56	1515.00	0.00
70-C-2	1880.40	30	414	1883.98	0.19	1490.20	21	410	1490.25	0.00	1371.97	19	260	1373.21	0.09
90-C-2	3252.77	35	240	3305.94	1.63	2669.76	29	68	2689.83	0.75	2320.42	21	196	2336.37	0.69
110-C-2	3818.68	49	579	3829.84	0.29	3085.58	39	538	3138.42	1.71	2387.89	29	499	2408.42	0.86
130-C-2	4573.45	52	361	4615.03	0.91	4150.05	45	461	4212.35	1.50	3113.82	32	379	3147.34	1.08
150-C-2	4700.10	59	866	4749.65	1.05	3990.39	47	856	4071.71	2.04	3266.04	34	432	3284.73	0.57
50-R-0	1280.85	12	2155	1282.68	0.14	1137.78	10	1393	1137.78	0.00	967.01	8	1705	968.94	0.20
70-R-0	1697.72	17	1422	1701.93	0.25	1416.53	14	4095	1422.00	0.39	1210.92	11	5329	1214.58	0.30
90-R-0	2151.74	23	2630	2159.50	0.36	1831.30	18	4819	1841.25	0.54	1506.53	14	7293	1510.67	0.27
110-R-0	2588.77	27	2947	2600.61	0.46	2186.13	22	4570	2201.42	0.70	1855.72	17	13660	1870.56	0.80
130-R-0	3022.40	32	5634	3037.19	0.49	2541.95	26	3104	2559.33	0.68	2113.31	20	7051	2127.12	0.65
150-R-0	3231.27	36	5771	3258.97	0.86	2818.31	31	4625	2843.07	0.88	2283.72	23	13281	2297.41	0.60
50-R-1	1302.77	13	59	1302.77	0.00	1102.58	10	71	1102.73	0.01	987.63	8	10	990.88	0.33
70-R-1	1628.69	17	251	1633.15	0.27	1428.03	14	112	1428.53	0.03	1192.04	10	1031	1196.34	0.36
90-R-1	2093.17	22	810	2097.97	0.23	1757.56	18	635	1760.58	0.17	1460.83	13	859	1472.19	0.78
110-R-1	2482.88	26	76	2490.76	0.32	2092.81	20	771	2103.35	0.50	1800.99	16	1564	1818.24	0.96
130-R-1	2899.78	31	925	2914.18	0.50	2419.08	24	843	2435.20	0.67	2071.88	19	1495	2084.94	0.63
150-R-1	3223.02	36	355	3250.40	0.85	2681.74	28	474	2708.96	1.02	2244.54	22	1601	2267.53	1.02
50-R-2	1995.97	21	73	1996.14	0.01	1861.42	19	12	1861.42	0.00	1462.78	13	69	1462.78	0.00
70-R-2	2641.13	31	735	2642.68	0.06	2238.20	22	378	2239.73	0.07	1994.12	19	86	1996.86	0.14
90-R-2	3142.75	36	307	3151.82	0.29	2640.08	29	362	2644.85	0.18	2306.25	22	128	2313.93	0.33
110-R-2	4436.35	51	917	4466.39	0.68	3662.41	40	382	3669.63	0.20	3056.60	28	373	3072.96	0.54
130-R-2	4782.98	53	554	4828.25	0.95	4177.69	47	504	4197.66	0.48	3338.15	32	389	3354.67	0.49
150-R-2	5231.54	57	917	5257.35	0.49	4253.93	48	598	4282.03	0.66	3575.41	34	707	3593.23	0.50
<i>average</i>					<i>0.50</i>					<i>0.65</i>					<i>0.58</i>

The notation of Table A.1 is used

Table A.3. Computational Results obtained for the 2|OU|VRPB configuration of the 2L-VRPB model

Instance	PD Class 0					PD Class 1					PD Class 2				
	bst	v	t	avg	%g	bst	v	t	avg	%g	bst	v	t	avg	%g
50-C-0	1340.75	13	433	1340.75	0.00	1148.62	11	1926	1149.25	0.05	925.48	8	1413	925.77	0.03
70-C-0	1270.22	18	3604	1272.00	0.14	1066.70	14	1451	1070.58	0.36	945.89	11	4491	953.02	0.75
90-C-0	2202.77	23	4840	2212.76	0.45	1883.43	19	3417	1887.26	0.20	1536.26	14	5067	1558.34	1.44
110-C-0	2144.86	28	2567	2148.19	0.16	1862.74	22	4914	1866.87	0.22	1508.66	17	8868	1518.31	0.64
130-C-0	3029.02	33	1436	3072.45	1.43	2553.57	27	2971	2582.57	1.14	2151.35	21	6606	2161.49	0.47
150-C-0	3207.90	38	3144	3223.86	0.50	2658.84	31	3836	2697.94	1.47	2253.61	24	7265	2279.23	1.14
50-C-1	1346.95	13	258	1347.59	0.05	1110.01	10	502	1110.54	0.05	1005.41	8	939	1005.49	0.01
70-C-1	1149.79	17	808	1149.96	0.01	1073.34	14	190	1085.98	1.18	890.76	10	2002	894.23	0.39
90-C-1	2061.34	22	1513	2101.73	1.96	1743.45	18	1218	1758.74	0.88	1447.42	14	1969	1466.79	1.34
110-C-1	2027.78	27	1389	2034.22	0.32	1741.11	21	857	1750.74	0.55	1411.96	16	2137	1431.55	1.39
130-C-1	2850.36	31	1822	2866.69	0.57	2401.61	25	1209	2412.12	0.44	2008.00	19	1509	2023.30	0.76
150-C-1	3105.43	37	1231	3129.11	0.76	2584.77	29	931	2632.40	1.84	2175.51	22	1335	2202.38	1.24
50-C-2	2086.37	21	274	2086.37	0.00	1927.75	19	206	1927.75	0.00	1570.35	13	153	1570.42	0.00
70-C-2	1907.55	30	155	1916.25	0.46	1523.98	21	285	1529.18	0.34	1424.81	19	242	1429.32	0.32
90-C-2	3419.63	37	579	3435.15	0.45	2749.95	31	110	2756.94	0.25	2417.77	22	572	2443.06	1.05
110-C-2	3928.76	52	176	3945.56	0.43	3199.18	40	291	3223.50	0.76	2477.78	30	290	2494.94	0.69
130-C-2	4704.21	54	484	4743.04	0.83	4263.83	46	595	4290.47	0.62	3228.95	33	480	3253.98	0.78
150-C-2	4867.38	60	1193	4924.02	1.16	4102.20	49	819	4141.16	0.95	3369.65	36	391	3395.53	0.77
50-R-0	1362.93	13	4351	1363.13	0.01	1246.95	11	146	1246.95	0.00	1187.95	8	977	1187.95	0.00
70-R-0	1808.73	18	1365	1808.78	0.00	1623.99	14	6465	1631.97	0.49	1472.10	11	1833	1474.22	0.14
90-R-0	2275.17	24	3681	2283.57	0.37	2017.80	19	3521	2030.75	0.64	1717.77	14	4384	1732.48	0.86
110-R-0	2752.07	28	1861	2761.82	0.35	2405.28	22	2213	2424.23	0.79	2136.77	17	6453	2154.29	0.82
130-R-0	3160.05	33	3520	3173.18	0.42	2793.65	27	3516	2824.15	1.09	2423.85	21	5214	2450.03	1.08
150-R-0	3415.93	38	1270	3431.70	0.46	3072.53	31	2587	3105.08	1.06	2643.40	23	8255	2676.31	1.24
50-R-1	1357.02	13	362	1374.83	1.31	1217.62	10	284	1217.85	0.02	1201.14	8	1004	1203.60	0.20
70-R-1	1694.33	17	370	1702.75	0.50	1578.53	14	909	1587.50	0.57	1429.04	10	1144	1437.87	0.62
90-R-1	2187.35	22	1227	2200.34	0.59	1921.80	19	370	1930.69	0.46	1665.51	14	452	1680.54	0.90
110-R-1	2613.54	27	808	2623.09	0.37	2292.36	21	1515	2321.91	1.29	2041.36	16	819	2059.33	0.88
130-R-1	3012.63	31	1316	3043.05	1.01	2661.16	25	683	2684.96	0.89	2328.07	19	1748	2363.78	1.53
150-R-1	3371.89	37	864	3389.60	0.53	2932.66	29	1048	2956.86	0.83	2515.74	23	1788	2536.19	0.81
50-R-2	2084.20	21	305	2084.20	0.00	1965.52	19	66	1965.52	0.00	1568.72	13	29	1571.80	0.20
70-R-2	2719.26	31	829	2719.26	0.00	2336.03	22	67	2342.73	0.29	2091.64	20	307	2094.18	0.12
90-R-2	3328.86	37	689	3347.76	0.57	2770.60	30	290	2780.59	0.36	2393.74	22	75	2396.93	0.13
110-R-2	4534.83	51	708	4556.63	0.48	3849.32	42	475	3869.78	0.53	3176.40	28	449	3203.84	0.86
130-R-2	4963.33	54	568	4984.29	0.42	4340.86	47	559	4375.04	0.79	3485.41	33	333	3507.89	0.64
150-R-2	5391.25	59	185	5432.39	0.76	4377.22	48	295	4399.41	0.51	3727.19	36	627	3757.75	0.82
<i>average</i>					<i>0.50</i>					<i>0.61</i>					<i>0.70</i>

The notation of Table A.1 is used

Table A.4. Computational Results obtained for the 2|OS|VRPB configuration of the 2L-VRPB model

Instance	PD Class 0					PD Class 1					PD Class 2				
	bst	v	t	avg	%g	bst	v	t	avg	%g	bst	v	t	avg	%g
50-C-0	1341.02	13	3199	1341.02	0.00	1148.62	11	1505	1149.11	0.04	925.48	8	3925	925.86	0.04
70-C-0	1270.56	18	3759	1271.48	0.07	1066.70	14	1815	1071.39	0.44	952.37	11	5707	955.39	0.32
90-C-0	2204.70	23	875	2218.52	0.63	1884.20	19	1618	1887.17	0.16	1536.84	14	2338	1550.37	0.88
110-C-0	2144.86	28	3699	2161.50	0.78	1862.74	22	4471	1873.85	0.60	1509.05	17	5328	1516.70	0.51
130-C-0	3056.30	33	1463	3073.35	0.56	2558.17	27	4526	2584.39	1.02	2156.74	21	3855	2162.31	0.26
150-C-0	3207.90	38	1513	3229.02	0.66	2658.84	31	4250	2691.31	1.22	2261.42	24	3073	2291.22	1.32
50-C-1	1369.85	13	910	1424.59	4.00	1147.52	10	3650	1149.59	0.18	1009.79	8	3827	1010.66	0.09
70-C-1	1159.75	17	3557	1166.56	0.59	1094.99	15	1976	1098.05	0.28	901.68	10	6293	909.99	0.92
90-C-1	2190.70	22	360	2190.70	0.00	1801.60	18	1667	1821.20	1.09	1516.55	14	516	1526.27	0.64
110-C-1	2038.29	28	1037	2057.34	0.93	1767.05	21	2448	1782.01	0.85	1440.51	17	3967	1460.22	1.37
130-C-1	2918.69	32	1275	2938.17	0.67	2443.61	26	1978	2472.89	1.20	2056.90	20	983	2075.56	0.91
150-C-1	3149.26	37	2473	3206.03	1.80	2675.08	30	1274	2727.38	1.96	2219.14	23	3076	2246.53	1.23
50-C-2	2091.44	21	494	2091.44	0.00	1957.09	19	11	1957.09	0.00	1588.05	13	259	1591.55	0.22
70-C-2	1907.55	30	1377	1913.13	0.29	1528.30	21	311	1530.30	0.13	1431.32	19	370	1435.12	0.26
90-C-2	3426.28	37	1563	3442.11	0.46	2757.73	31	143	2774.39	0.60	2461.44	22	1657	2465.64	0.17
110-C-2	3967.28	52	459	4006.88	1.00	3203.13	40	791	3232.74	0.92	2493.36	30	1032	2513.35	0.80
130-C-2	4723.64	54	1324	4753.40	0.63	4285.64	46	726	4312.22	0.62	3251.68	33	733	3272.95	0.65
150-C-2	4890.84	60	718	4929.75	0.80	4146.15	49	673	4163.74	0.42	3388.86	36	935	3410.11	0.63
50-R-0	1362.93	13	6328	1363.16	0.02	1246.95	11	3514	1246.95	0.00	1187.95	8	2304	1187.95	0.00
70-R-0	1808.73	18	3255	1808.75	0.00	1626.56	14	4842	1638.22	0.72	1472.10	11	5462	1475.63	0.24
90-R-0	2277.41	24	4139	2287.10	0.43	2019.21	19	3396	2031.40	0.60	1720.56	14	4330	1731.71	0.65
110-R-0	2756.00	28	5114	2773.78	0.65	2413.16	23	4036	2429.48	0.68	2138.57	17	8822	2159.35	0.97
130-R-0	3165.37	33	3671	3185.90	0.65	2793.84	27	1528	2836.18	1.52	2424.62	20	2215	2453.44	1.19
150-R-0	3415.93	38	2713	3437.03	0.62	3072.53	31	3794	3101.85	0.95	2654.13	23	5031	2701.16	1.77
50-R-1	1376.74	13	195	1377.92	0.09	1233.99	10	2280	1234.98	0.08	1203.45	8	2716	1208.52	0.42
70-R-1	1729.93	17	2042	1737.82	0.46	1640.51	14	1090	1656.95	1.00	1463.12	10	1844	1472.64	0.65
90-R-1	2236.88	23	1511	2244.18	0.33	1941.09	19	597	1949.90	0.45	1692.51	14	2085	1707.60	0.89
110-R-1	2661.62	28	2335	2672.21	0.40	2399.08	21	1350	2399.08	0.00	2070.32	17	2627	2089.20	0.91
130-R-1	3062.89	32	2267	3087.50	0.80	2761.50	25	818	2786.66	0.91	2389.10	20	1321	2411.56	0.94
150-R-1	3465.95	37	2191	3497.88	0.92	2996.06	30	1735	3024.59	0.95	2588.64	23	1657	2618.76	1.16
50-R-2	2087.87	21	32	2087.87	0.00	1981.98	19	45	1981.98	0.00	1583.59	13	118	1585.35	0.11
70-R-2	2727.18	31	1066	2729.54	0.09	2349.81	22	392	2360.24	0.44	2097.07	20	96	2100.45	0.16
90-R-2	3349.77	37	1124	3378.85	0.87	2796.94	30	329	2800.50	0.13	2456.61	22	465	2468.91	0.50
110-R-2	4549.27	53	465	4566.78	0.38	3858.50	42	451	3872.23	0.36	3198.62	28	330	3231.91	1.04
130-R-2	4965.68	54	383	5007.74	0.85	4346.58	47	417	4382.12	0.82	3503.76	34	214	3519.74	0.46
150-R-2	5391.25	59	817	5441.78	0.94	4419.51	49	228	4441.28	0.49	3752.01	36	471	3776.54	0.65
<i>average</i>					<i>0.62</i>					<i>0.61</i>					<i>0.67</i>

The notation of Table A.1 is used

Table A.5. Computational Results obtained for the 2|RU|VRPB configuration of the 2L-VRPB model

Instance	PD Class 0					PD Class 1					PD Class 2				
	<i>bst</i>	<i>v</i>	<i>t</i>	<i>avg</i>	<i>%g</i>	<i>bst</i>	<i>v</i>	<i>t</i>	<i>avg</i>	<i>%g</i>	<i>bst</i>	<i>v</i>	<i>t</i>	<i>avg</i>	<i>%g</i>
50-C-0	1318.56	12	1308	1319.72	0.09	1119.05	10	1711	1130.51	1.02	923.03	8	1435	937.13	1.53
70-C-0	1218.89	17	4634	1224.00	0.42	1040.88	14	1653	1049.89	0.87	929.50	10	10410	937.33	0.84
90-C-0	2177.06	23	935	2178.09	0.05	1834.51	19	5984	1837.74	0.18	1488.20	13	5692	1522.60	2.31
110-C-0	2104.65	27	3420	2106.51	0.09	1772.04	21	7404	1790.81	1.06	1460.05	17	10685	1487.27	1.86
130-C-0	2973.59	32	4220	2979.77	0.21	2493.59	26	2674	2509.83	0.65	2057.00	20	7814	2065.27	0.40
150-C-0	3120.85	36	5803	3140.03	0.61	2578.62	31	1406	2598.75	0.78	2200.96	23	2978	2208.94	0.36
50-C-1	1334.16	13	781	1335.77	0.12	1102.14	10	736	1102.77	0.06	1003.70	8	594	1003.98	0.03
70-C-1	1141.41	17	593	1142.79	0.12	1065.93	14	663	1068.81	0.27	883.49	10	113	886.34	0.32
90-C-1	2036.93	22	526	2043.19	0.31	1724.10	18	1007	1734.29	0.59	1399.39	13	807	1410.01	0.76
110-C-1	1978.39	26	1047	2002.30	1.21	1715.61	21	431	1728.63	0.76	1391.68	17	1042	1396.98	0.38
130-C-1	2761.77	30	1378	2803.96	1.53	2348.39	24	1091	2372.30	1.02	1982.61	19	1449	1999.53	0.85
150-C-1	3029.52	36	1234	3050.14	0.68	2528.78	29	836	2545.78	0.67	2139.84	22	1377	2157.27	0.81
50-C-2	2002.18	20	108	2002.18	0.00	1916.58	19	36	1916.61	0.00	1553.03	13	74	1553.03	0.00
70-C-2	1881.15	30	452	1886.34	0.28	1515.50	21	142	1518.20	0.18	1389.10	20	153	1390.52	0.10
90-C-2	3262.52	36	434	3309.39	1.44	2680.07	29	216	2693.37	0.50	2339.23	21	69	2353.45	0.61
110-C-2	3821.72	50	617	3841.56	0.52	3093.59	39	264	3099.19	0.18	2411.61	29	271	2423.13	0.48
130-C-2	4580.92	52	402	4628.55	1.04	4157.77	45	518	4200.42	1.03	3148.47	33	159	3178.23	0.95
150-C-2	4728.39	58	992	4752.53	0.51	4023.93	47	743	4088.12	1.60	3298.15	35	124	3312.15	0.42
50-R-0	1309.34	12	5173	1318.34	0.69	1229.20	10	6335	1239.35	0.83	1177.96	8	833	1178.13	0.01
70-R-0	1766.83	17	3816	1768.36	0.09	1566.39	14	401	1576.34	0.64	1456.01	11	4160	1459.36	0.23
90-R-0	2206.17	23	6302	2214.72	0.39	1972.08	18	5352	1988.16	0.82	1690.13	14	6153	1704.18	0.83
110-R-0	2678.39	27	3195	2699.54	0.79	2371.80	22	2702	2388.08	0.69	2103.88	17	7559	2121.32	0.83
130-R-0	3088.87	32	4995	3103.77	0.48	2741.20	26	2840	2770.50	1.07	2357.71	20	5923	2369.38	0.49
150-R-0	3317.69	36	3418	3326.85	0.28	3008.32	30	1188	3030.04	0.72	2569.98	22	6823	2597.93	1.09
50-R-1	1315.56	13	41	1315.56	0.00	1190.55	10	812	1194.04	0.29	1171.63	8	189	1171.79	0.01
70-R-1	1682.83	17	938	1684.19	0.08	1545.71	14	83	1552.56	0.44	1405.73	10	1076	1411.05	0.38
90-R-1	2149.74	22	195	2155.80	0.28	1876.54	18	390	1885.44	0.47	1637.42	14	1232	1652.95	0.95
110-R-1	2564.06	27	1002	2576.34	0.48	2254.97	20	604	2268.09	0.58	2003.98	16	391	2019.60	0.78
130-R-1	2949.01	31	1216	2964.54	0.53	2584.80	24	578	2618.52	1.30	2293.07	19	966	2325.30	1.41
150-R-1	3284.13	36	1160	3312.97	0.88	2855.15	28	986	2887.44	1.13	2473.07	22	1565	2497.07	0.97
50-R-2	2012.62	21	703	2012.62	0.00	1879.47	19	11	1879.47	0.00	1531.78	13	168	1531.78	0.00
70-R-2	2662.79	31	374	2663.73	0.04	2292.51	22	247	2297.40	0.21	2054.97	19	233	2058.91	0.19
90-R-2	3155.77	36	544	3168.14	0.39	2689.99	29	357	2695.53	0.21	2326.12	22	148	2334.86	0.38
110-R-2	4452.64	51	86	4482.97	0.68	3694.01	40	216	3703.76	0.26	3103.60	28	427	3116.64	0.42
130-R-2	4809.55	53	131	4849.83	0.84	4231.55	47	452	4265.40	0.80	3428.31	32	122	3444.88	0.48
150-R-2	5245.58	58	378	5282.36	0.70	4297.18	48	245	4321.06	0.56	3652.71	35	597	3661.68	0.25
<i>average</i>					<i>0.47</i>					<i>0.62</i>					<i>0.63</i>

The notation of Table A.1 is used

Table A.6. Computational Results obtained for the 2|RS|VRPB configuration of the 2L-VRPB model

Instance	PD Class 0					PD Class 1					PD Class 2				
	bst	v	t	avg	%g	bst	v	t	avg	%g	bst	v	t	avg	%g
50-C-0	1331.89	12	9705	1333.57	0.13	1146.85	11	3079	1147.50	0.06	924.41	8	7217	925.03	0.07
70-C-0	1236.66	17	11158	1249.55	1.04	1062.10	14	1535	1063.88	0.17	934.31	11	4137	944.27	1.07
90-C-0	2178.81	23	7694	2180.46	0.08	1845.90	19	4488	1860.61	0.80	1527.28	14	6875	1543.22	1.04
110-C-0	2118.97	27	8079	2123.21	0.20	1811.24	22	4137	1844.93	1.86	1506.81	17	5219	1516.07	0.61
130-C-0	2986.09	33	6063	2996.81	0.36	2522.27	27	2860	2544.48	0.88	2069.08	20	8130	2103.32	1.65
150-C-0	3172.57	37	6756	3183.22	0.34	2618.97	31	3548	2632.32	0.51	2234.58	23	11365	2254.54	0.89
50-C-1	1343.04	13	2050	1343.13	0.01	1110.33	10	3435	1112.54	0.20	1007.01	8	3153	1007.09	0.01
70-C-1	1148.43	17	2945	1149.00	0.05	1084.80	14	1751	1088.44	0.34	898.73	10	392	902.10	0.38
90-C-1	2095.02	22	3877	2134.22	1.87	1759.76	18	3096	1777.31	1.00	1462.62	14	3537	1506.55	3.00
110-C-1	2022.32	27	3402	2032.13	0.49	1740.95	21	1109	1755.97	0.86	1426.41	17	3427	1442.70	1.14
130-C-1	2858.54	31	2248	2887.09	1.00	2399.71	25	1799	2412.14	0.52	2011.49	19	3522	2035.58	1.20
150-C-1	3108.18	37	2512	3141.61	1.08	2592.78	30	1791	2628.54	1.38	2195.00	23	455	2216.64	0.99
50-C-2	2042.95	21	34	2042.95	0.00	1918.47	18	31	1918.51	0.00	1565.66	13	865	1565.92	0.02
70-C-2	1884.69	30	1616	1890.23	0.29	1515.50	21	659	1517.58	0.14	1394.89	20	483	1395.32	0.03
90-C-2	3318.80	36	743	3347.01	0.85	2684.32	29	356	2706.76	0.84	2348.10	22	474	2357.69	0.41
110-C-2	3859.94	51	1224	3892.73	0.85	3095.26	39	566	3103.58	0.27	2433.16	30	1188	2445.13	0.49
130-C-2	4580.92	52	598	4634.73	1.17	4183.99	45	339	4222.12	0.91	3176.92	32	646	3200.01	0.73
150-C-2	4728.39	58	1051	4771.65	0.91	4028.59	47	1299	4069.56	1.02	3302.37	35	898	3319.09	0.51
50-R-0	1326.43	13	4175	1327.33	0.07	1244.89	11	3281	1244.89	0.00	1181.04	8	5726	1182.01	0.08
70-R-0	1773.39	18	7712	1773.58	0.01	1589.60	14	8794	1601.37	0.74	1469.12	11	9098	1471.83	0.18
90-R-0	2210.21	23	1781	2216.18	0.27	1998.16	19	6205	2010.75	0.63	1716.16	14	3974	1722.46	0.37
110-R-0	2714.05	27	5711	2733.99	0.73	2387.74	22	4334	2408.72	0.88	2126.40	17	5818	2142.16	0.74
130-R-0	3114.79	33	5893	3131.85	0.55	2779.60	27	1722	2812.70	1.19	2386.41	20	7729	2413.13	1.12
150-R-0	3349.58	37	3807	3387.90	1.14	3047.30	31	5818	3059.76	0.41	2608.39	23	7660	2643.66	1.35
50-R-1	1356.72	13	2711	1356.77	0.00	1211.61	10	2734	1213.67	0.17	1199.48	8	4547	1202.55	0.26
70-R-1	1710.52	17	2609	1712.20	0.10	1595.15	14	3907	1607.01	0.74	1436.88	10	4578	1448.37	0.80
90-R-1	2190.30	23	956	2198.18	0.36	1920.50	19	681	1926.68	0.32	1676.49	14	1165	1690.33	0.83
110-R-1	2630.56	27	3053	2643.08	0.48	2308.86	21	1560	2342.32	1.45	2053.48	17	3636	2068.38	0.73
130-R-1	3005.77	31	1746	3029.40	0.79	2670.47	25	1529	2717.30	1.75	2373.29	20	1866	2393.19	0.84
150-R-1	3382.20	37	2940	3408.83	0.79	2938.76	29	752	2975.14	1.24	2544.99	23	2600	2576.53	1.24
50-R-2	2015.59	21	844	2015.73	0.01	1896.16	19	25	1896.16	0.00	1541.35	13	190	1541.81	0.03
70-R-2	2672.32	31	1737	2672.56	0.01	2293.98	22	629	2304.20	0.45	2063.97	20	404	2066.56	0.13
90-R-2	3167.49	36	1744	3178.10	0.34	2703.85	29	458	2713.65	0.36	2340.01	22	89	2343.73	0.16
110-R-2	4474.58	51	142	4491.22	0.37	3699.03	40	688	3707.08	0.22	3139.43	28	800	3157.86	0.59
130-R-2	4845.07	54	720	4876.78	0.65	4268.26	47	668	4297.28	0.68	3435.89	32	650	3451.89	0.47
150-R-2	5275.30	58	384	5299.25	0.45	4311.83	47	898	4333.35	0.50	3685.30	36	529	3702.49	0.47
<i>average</i>					<i>0.50</i>					<i>0.65</i>					<i>0.68</i>

The notation of Table A.1 is used

Table A.7. Computational Results obtained for the 2|OU|BiVRP configuration of the 2L-BiVRP model

Instance	PD Class 0					PD Class 1					PD Class 2				
	bst	v	t	avg	%g	bst	v	t	avg	%g	bst	v	t	avg	%g
50-C-0-D	1330.59	13	236	1330.59	0.00	1107.71	11	392	1107.71	0.00	842.81	7	1525	843.40	0.07
50-C-0-P	318.70	2	0	318.70	0.00	555.03	5	1	555.03	0.00	843.13	7	1929	843.33	0.02
70-C-0-D	1246.88	18	2245	1247.22	0.03	1007.58	14	1730	1009.28	0.17	812.57	11	1355	812.62	0.01
70-C-0-P	319.90	3	0	319.90	0.00	580.29	6	3698	580.38	0.02	779.22	10	1994	781.74	0.32
90-C-0-D	2172.75	23	2684	2178.54	0.27	1811.61	19	983	1821.12	0.52	1381.66	14	2676	1381.89	0.02
90-C-0-P	457.42	3	2	457.42	0.00	805.71	8	91	805.71	0.00	1268.68	12	2905	1272.84	0.33
110-C-0-D	2118.52	28	2894	2123.14	0.22	1780.18	22	1361	1788.82	0.49	1389.42	17	2951	1394.43	0.36
110-C-0-P	454.89	4	53	454.89	0.00	868.97	10	2803	873.85	0.56	1245.73	15	2985	1246.86	0.09
130-C-0-D	2988.13	33	2439	3013.28	0.84	2464.14	27	2451	2473.91	0.40	1990.91	21	1808	1993.68	0.14
130-C-0-P	645.93	5	2	645.93	0.00	1150.09	11	806	1150.09	0.00	1715.26	17	1120	1739.35	1.40
150-C-0-D	3151.80	37	1148	3179.78	0.89	2557.65	31	1582	2571.72	0.55	2065.30	23	1565	2077.31	0.58
150-C-0-P	705.73	6	103	705.73	0.00	1205.11	12	4883	1207.80	0.22	1804.87	20	310	1813.48	0.48
50-C-1-D	1335.11	13	659	1338.16	0.23	1074.51	10	896	1074.51	0.00	905.69	8	76	905.74	0.01
50-C-1-P	294.11	2	0	294.11	0.00	543.83	5	0	543.83	0.00	831.56	7	522	832.12	0.07
70-C-1-D	1126.11	17	49	1127.20	0.10	1043.73	14	961	1049.59	0.56	759.71	10	149	760.28	0.08
70-C-1-P	315.97	3	0	315.97	0.00	458.56	6	279	458.56	0.00	769.07	10	262	769.07	0.00
90-C-1-D	2073.00	22	1632	2077.19	0.20	1694.20	18	1728	1704.98	0.64	1326.79	13	574	1326.79	0.00
90-C-1-P	446.14	3	1	446.14	0.00	797.41	7	523	797.69	0.04	1173.77	12	573	1200.92	2.31
110-C-1-D	1999.58	27	1163	2005.06	0.27	1686.65	21	411	1692.92	0.37	1302.79	16	288	1303.65	0.07
110-C-1-P	413.97	4	0	413.97	0.00	774.00	9	681	775.60	0.21	1129.71	14	728	1129.85	0.01
130-C-1-D	2834.60	31	806	2838.69	0.14	2318.02	25	615	2324.18	0.27	1825.56	19	686	1827.80	0.12
130-C-1-P	565.08	5	16	565.08	0.00	1101.31	11	109	1101.31	0.00	1625.80	16	679	1649.05	1.43
150-C-1-D	3076.90	36	920	3088.34	0.37	2469.23	29	509	2484.21	0.61	1944.75	22	876	1952.48	0.40
150-C-1-P	667.41	5	1902	668.45	0.16	1175.41	13	1084	1215.48	3.41	1788.76	19	175	1801.04	0.69
50-C-2-D	2079.44	21	107	2079.44	0.00	1921.76	19	31	1921.76	0.00	1443.85	13	5	1443.85	0.00
50-C-2-P	335.23	3	0	335.23	0.00	584.42	5	1	584.42	0.00	1141.70	11	9	1141.70	0.00
70-C-2-D	1898.45	30	488	1900.24	0.09	1487.95	21	418	1487.95	0.00	1229.32	16	198	1229.32	0.00
70-C-2-P	443.14	5	0	443.14	0.00	841.74	12	10	841.74	0.00	1207.20	18	157	1207.36	0.01
90-C-2-D	3393.54	37	443	3409.53	0.47	2688.74	31	38	2688.74	0.00	1970.56	21	1123	1984.47	0.71
90-C-2-P	602.63	6	0	602.63	0.00	1340.16	13	384	1342.36	0.16	2022.65	21	321	2046.97	1.20
110-C-2-D	3905.61	51	435	3942.33	0.94	3170.47	41	106	3188.06	0.55	2326.01	29	960	2341.65	0.67
110-C-2-P	447.18	4	52	447.18	0.00	1156.08	15	42	1156.08	0.00	2090.93	27	84	2110.59	0.94
130-C-2-D	4693.90	54	452	4697.66	0.08	4200.04	45	132	4206.60	0.16	3050.82	32	1234	3063.47	0.41
130-C-2-P	862.99	7	25	862.99	0.00	1403.69	14	75	1403.74	0.00	2504.64	27	515	2516.60	0.48
150-C-2-D	4824.11	60	241	4851.34	0.56	3945.77	49	678	3958.58	0.32	2999.26	35	1118	3001.33	0.07
150-C-2-P	939.74	9	150	939.74	0.00	1936.05	20	573	1936.05	0.00	2786.51	34	437	2801.75	0.55
50-R-0-D	1327.00	13	181	1327.00	0.00	1159.73	11	1379	1159.73	0.00	896.10	7	1784	896.10	0.00
50-R-0-P	399.25	2	0	399.25	0.00	588.97	4	401	588.97	0.00	948.36	7	3647	948.36	0.00
70-R-0-D	1752.93	18	571	1753.69	0.04	1457.05	14	2923	1458.43	0.09	1175.93	11	2949	1185.50	0.81
70-R-0-P	510.47	3	19	510.47	0.00	856.82	6	2904	856.82	0.00	1141.38	10	479	1141.44	0.01
90-R-0-D	2212.39	24	1192	2217.35	0.22	1897.65	19	6260	1901.41	0.20	1458.10	14	3510	1459.39	0.09
90-R-0-P	566.70	3	123	566.70	0.00	958.95	8	324	958.95	0.00	1347.91	13	441	1348.94	0.08
110-R-0-D	2668.75	28	6131	2671.68	0.11	2212.34	22	4995	2221.56	0.42	1752.39	17	3336	1771.99	1.12
110-R-0-P	705.19	4	77	705.19	0.00	1209.75	10	5273	1214.64	0.40	1674.95	15	5981	1677.18	0.13
130-R-0-D	3097.20	33	5246	3104.77	0.24	2615.85	27	2882	2635.14	0.74	2066.28	20	2594	2083.21	0.82
130-R-0-P	690.68	5	5	690.68	0.00	1334.22	11	4520	1339.76	0.42	1847.76	17	1771	1853.32	0.30
150-R-0-D	3327.99	37	4260	3346.13	0.55	2916.63	32	228	2928.44	0.40	2255.64	23	7265	2267.66	0.53
150-R-0-P	810.54	6	4330	810.54	0.00	1341.24	12	8154	1343.07	0.14	2027.34	20	6308	2037.01	0.48
50-R-1-D	1353.77	13	259	1367.29	1.00	1114.17	10	74	1122.43	0.74	943.09	8	56	943.09	0.00
50-R-1-P	378.01	2	0	378.01	0.00	665.16	5	16	665.24	0.01	888.58	7	404	888.58	0.00
70-R-1-D	1638.59	17	2179	1645.09	0.40	1448.59	14	2373	1456.18	0.52	1132.65	10	634	1133.33	0.06
70-R-1-P	514.68	3	0	514.68	0.00	725.62	5	239	725.62	0.00	1066.86	9	59	1068.99	0.20
90-R-1-D	2138.70	22	948	2145.03	0.30	1780.81	18	538	1795.49	0.82	1372.43	13	95	1397.70	1.84
90-R-1-P	512.27	3	2	512.27	0.00	909.88	7	1540	913.69	0.42	1292.84	12	721	1292.84	0.00
110-R-1-D	2553.04	27	1000	2562.05	0.35	2125.09	21	958	2132.01	0.33	1710.18	16	382	1720.05	0.58
110-R-1-P	618.03	4	17	618.03	0.00	1119.99	9	1871	1121.07	0.10	1492.41	14	107	1496.00	0.24
130-R-1-D	2958.59	31	820	2971.02	0.42	2483.88	25	1413	2495.61	0.47	1947.68	19	1442	1960.14	0.64
130-R-1-P	683.44	5	2	683.44	0.00	1261.10	11	1028	1264.61	0.28	1817.05	17	1287	1825.50	0.47
150-R-1-D	3306.79	37	1444	3317.17	0.31	2744.78	29	821	2757.40	0.46	2192.32	22	1970	2209.96	0.80
150-R-1-P	726.44	5	14	730.08	0.50	1342.79	12	3072	1355.77	0.97	1913.86	19	1071	1922.86	0.47
50-R-2-D	2063.69	21	100	2063.69	0.00	1932.59	19	17	1932.59	0.00	1404.73	13	13	1404.73	0.00
50-R-2-P	285.43	3	0	285.43	0.00	543.02	5	18	543.02	0.00	1088.48	11	2	1088.86	0.03
70-R-2-D	2664.35	31	584	2664.35	0.00	2181.03	22	719	2181.72	0.03	1602.84	16	20	1602.84	0.00
70-R-2-P	588.32	5	0	588.32	0.00	1113.60	12	3	1113.60	0.00	1786.33	19	241	1786.33	0.00
90-R-2-D	3294.18	37	758	3302.20	0.24	2688.99	30	230	2689.35	0.01	2163.30	22	99	2164.26	0.04
90-R-2-P	736.25	6	2	736.25	0.00	1356.85	13	9	1356.85	0.00	1874.84	22	659	1874.84	0.00
110-R-2-D	4516.27	52	49	4519.47	0.07	3773.72	42	590	3777.85	0.11	2655.22	28	95	2664.20	0.34
110-R-2-P	589.34	4	1	589.34	0.00	1386.19	15	1300	1386.19	0.00	2495.29	27	591	2495.29	0.00
130-R-2-D	4901.71	55	26	4917.77	0.33	4212.02	47	443	4218.90	0.16	3241.88	32	922	3256.67	0.46
130-R-2-P	817.68	7	21	817.68	0.00	1574.96	14	766	1577.65	0.17	2523.84	27	1181	2529.25	0.21
150-R-2-D	5320.94	59	95	5346.19	0.47	4203.38	48	253	4214.72	0.27	3335.77	35	38	3338.60	0.08
150-R-2-P	844.57	9	1	844.57	0.00	2097.23	21	161	2097.25	0.00	2980.59	32	443	2992.01	0.38
average					0.16					0.26					0.35

The notation of Table A.1 is used - **D** suffix denotes the delivery sub-problems of the original instances - **P** suffix denotes the pick-up sub-problems of the original instances

Table A.8. Computational Results obtained for the 2|OS|BiVRP configuration of the 2L-BiVRP model

Instance	PD Class 0					PD Class 1					PD Class 2				
	bst	v	t	avg	%g	bst	v	t	avg	%g	bst	v	t	avg	%g
50-C-0-D	1331.79	13	2351	1331.79	0.00	1107.71	11	821	1107.71	0.00	842.81	7	3274	843.79	0.12
50-C-0-P	318.70	2	0	318.70	0.00	555.03	5	1	555.03	0.00	843.13	7	846	844.39	0.15
70-C-0-D	1246.88	18	1295	1247.22	0.03	1007.58	14	1889	1010.80	0.32	812.57	11	3672	813.18	0.08
70-C-0-P	319.90	3	0	319.90	0.00	581.00	6	5560	581.00	0.00	779.22	10	3538	782.00	0.36
90-C-0-D	2180.66	23	5047	2190.56	0.45	1817.41	19	2468	1827.17	0.54	1381.66	14	4147	1382.22	0.04
90-C-0-P	457.42	3	14	457.42	0.00	805.71	8	1242	805.71	0.00	1272.97	12	1458	1283.74	0.85
110-C-0-D	2119.41	28	3533	2122.90	0.16	1780.77	22	3265	1786.37	0.31	1389.42	17	7089	1394.63	0.38
110-C-0-P	455.94	4	97	455.94	0.00	868.97	10	3155	873.54	0.53	1245.95	15	7577	1247.98	0.16
130-C-0-D	2999.21	33	2757	3024.59	0.85	2464.14	27	1545	2469.53	0.22	1992.02	21	1731	1995.02	0.15
130-C-0-P	645.93	5	5	645.93	0.00	1150.09	11	1117	1150.09	0.00	1715.26	17	3335	1737.17	1.28
150-C-0-D	3153.22	37	2481	3168.33	0.48	2557.65	31	8329	2565.84	0.32	2065.30	23	2141	2073.27	0.39
150-C-0-P	705.73	6	970	705.73	0.00	1205.62	12	1284	1207.76	0.18	1804.87	20	4460	1813.62	0.48
50-C-1-D	1359.16	13	1288	1397.46	2.82	1110.25	10	4454	1110.68	0.04	907.05	8	193	907.05	0.00
50-C-1-P	294.11	2	0	294.11	0.00	551.36	5	3296	551.89	0.10	842.02	8	1	842.02	0.00
70-C-1-D	1135.93	17	3488	1137.82	0.17	1055.41	14	3055	1055.50	0.01	761.93	10	4997	761.95	0.00
70-C-1-P	328.66	3	1	328.66	0.00	460.20	6	20	460.20	0.00	773.18	10	2814	773.74	0.07
90-C-1-D	2139.01	22	2550	2168.63	1.39	1710.75	18	4942	1722.77	0.70	1340.01	14	6952	1345.01	0.37
90-C-1-P	448.28	3	40	448.28	0.00	806.68	7	851	809.93	0.40	1173.77	12	4065	1182.89	0.78
110-C-1-D	2017.89	28	2418	2029.62	0.58	1691.02	21	3272	1714.22	1.37	1326.48	17	4523	1332.24	0.43
110-C-1-P	416.27	4	215	416.27	0.00	775.98	10	4889	778.77	0.36	1149.31	14	4736	1156.44	0.62
130-C-1-D	2884.28	31	4974	2910.86	0.92	2354.37	25	4620	2372.67	0.78	1847.03	19	3923	1856.50	0.51
130-C-1-P	569.81	5	4	569.81	0.00	1112.82	11	4667	1114.35	0.14	1689.30	17	533	1693.64	0.26
150-C-1-D	3124.63	37	6550	3146.77	0.71	2519.80	30	3732	2579.55	2.37	1984.57	23	3919	1993.67	0.46
150-C-1-P	670.89	5	2703	674.61	0.55	1175.41	13	4045	1176.55	0.10	1837.23	19	3129	1851.21	0.76
50-C-2-D	2086.39	21	51	2086.39	0.00	1951.10	19	20	1951.10	0.00	1448.69	13	129	1448.69	0.00
50-C-2-P	335.23	3	0	335.23	0.00	585.43	5	0	585.43	0.00	1143.45	11	31	1143.45	0.00
70-C-2-D	1899.51	30	1057	1900.25	0.04	1489.87	21	722	1489.87	0.00	1233.31	16	503	1234.03	0.06
70-C-2-P	443.14	5	0	443.14	0.00	852.98	12	6	852.98	0.00	1216.42	18	749	1216.64	0.02
90-C-2-D	3399.76	37	1351	3413.60	0.41	2701.62	31	827	2701.62	0.00	1977.70	21	1230	1991.41	0.69
90-C-2-P	602.63	6	1	602.63	0.00	1345.96	13	14	1345.96	0.00	2032.15	21	1532	2053.68	1.06
110-C-2-D	3960.85	51	1201	3987.51	0.67	3175.16	41	1481	3184.61	0.30	2328.51	29	670	2342.87	0.62
110-C-2-P	448.29	4	29	448.29	0.00	1156.89	15	58	1156.89	0.00	2097.17	27	1650	2112.09	0.71
130-C-2-D	4697.78	54	432	4704.45	0.14	4218.39	45	1451	4230.91	0.30	3054.59	32	788	3065.24	0.35
130-C-2-P	863.46	7	160	863.46	0.00	1406.29	14	671	1406.40	0.01	2521.23	27	891	2522.03	0.03
150-C-2-D	4824.11	60	2699	4855.32	0.65	3965.62	49	2167	3985.74	0.51	3010.37	35	950	3013.56	0.11
150-C-2-P	941.10	9	67	941.10	0.00	1945.33	20	221	1945.71	0.02	2796.43	34	2447	2817.50	0.75
50-R-0-D	1327.00	13	1382	1327.00	0.00	1159.73	11	3033	1159.73	0.00	896.10	7	1505	896.10	0.00
50-R-0-P	399.25	2	0	399.25	0.00	588.97	4	167	588.97	0.00	948.36	7	20	949.60	0.13
70-R-0-D	1752.93	18	8224	1754.00	0.06	1457.05	14	17599	1460.23	0.22	1176.71	11	419	1187.20	0.89
70-R-0-P	510.47	3	7	510.47	0.00	856.82	6	4687	856.82	0.00	1141.38	10	1977	1141.38	0.00
90-R-0-D	2213.05	24	1439	2218.67	0.25	1898.98	19	2497	1903.47	0.24	1458.10	14	3660	1458.94	0.06
90-R-0-P	566.70	3	137	566.70	0.00	958.95	8	811	958.95	0.00	1347.91	13	4730	1348.98	0.08
110-R-0-D	2668.79	28	6228	2674.87	0.23	2215.52	22	7107	2224.34	0.40	1762.14	17	1822	1772.34	0.58
110-R-0-P	705.19	4	12	705.19	0.00	1209.75	10	4542	1214.39	0.38	1674.97	15	8078	1678.17	0.19
130-R-0-D	3097.20	33	4798	3111.66	0.47	2632.01	27	2025	2642.22	0.39	2066.28	20	2430	2081.92	0.76
130-R-0-P	690.68	5	6	690.68	0.00	1334.22	11	4286	1343.21	0.67	1847.76	17	4070	1853.90	0.83
150-R-0-D	3327.99	37	1983	3345.65	0.53	2916.63	32	1929	2930.38	0.47	2256.40	23	5067	2274.73	0.31
150-R-0-P	810.54	6	196	811.03	0.06	1343.37	12	5990	1347.00	0.27	2030.04	20	6861	2038.26	0.40
50-R-1-D	1366.07	13	2607	1369.30	0.24	1136.65	10	3722	1139.30	0.23	961.74	8	5741	962.02	0.03
50-R-1-P	378.01	2	1	378.01	0.00	671.65	5	135	671.65	0.00	904.77	7	1859	906.92	0.24
70-R-1-D	1660.04	17	1125	1664.82	0.29	1502.74	14	6250	1517.18	0.96	1146.17	10	4931	1146.86	0.06
70-R-1-P	534.03	3	93	534.03	0.00	736.42	6	93	736.42	0.00	1090.60	10	5782	1090.85	0.02
90-R-1-D	2178.20	23	3450	2191.65	0.62	1808.63	19	5988	1812.13	0.19	1409.55	14	939	1411.86	0.16
90-R-1-P	515.19	3	3	515.19	0.00	933.66	7	784	936.23	0.28	1309.50	12	2794	1309.50	0.00
110-R-1-D	2584.96	27	4815	2598.60	0.53	2189.41	21	9071	2212.09	1.04	1729.82	17	5422	1748.96	1.11
110-R-1-P	618.03	4	16	618.03	0.00	1140.14	9	2543	1144.84	0.41	1529.74	14	4912	1533.71	0.26
130-R-1-D	3007.91	32	1204	3019.33	0.38	2538.46	25	4834	2566.60	1.11	1983.33	19	2802	2006.75	1.18
130-R-1-P	687.01	5	2	687.01	0.00	1283.86	11	2650	1289.40	0.43	1855.26	17	3240	1869.30	0.76
150-R-1-D	3376.54	37	4423	3400.50	0.71	2781.03	30	5687	2799.58	0.67	2230.02	23	1955	2245.52	0.70
150-R-1-P	740.73	5	678	741.43	0.10	1386.34	13	4497	1395.96	0.69	1946.64	20	3706	1957.23	0.54
50-R-2-D	2067.54	21	133	2067.54	0.00	1951.15	19	29	1951.15	0.00	1425.42	13	63	1425.42	0.00
50-R-2-P	285.43	3	0	285.43	0.00	573.09	5	6	573.09	0.00	1091.08	11	133	1091.08	0.00
70-R-2-D	2664.35	31	734	2664.35	0.00	2185.77	22	401	2191.25	0.25	1603.48	16	1016	1603.48	0.00
70-R-2-P	588.32	5	0	588.32	0.00	1140.63	12	77	1140.63	0.00	1806.23	19	653	1806.23	0.00
90-R-2-D	3328.00	37	1247	3337.89	0.30	2700.04	30	478	2700.04	0.00	2194.11	22	1062	2194.11	0.00
90-R-2-P	736.25	6	1	736.25	0.00	1380.58	13	1242	1380.90	0.02	1881.82	22	196	1881.82	0.00
110-R-2-D	4531.04	53	823	4533.02	0.04	3783.02	42	460	3786.58	0.09	2682.59	28	644	2685.80	0.12
110-R-2-P	593.40	4	1	593.40	0.00	1396.38	15	64	1396.38	0.00	2524.68	27	1853	2524.68	0.00
130-R-2-D	4912.45	55	2099	4922.88	0.21	4215.22	47	1604	4227.72	0.30	3263.84	33	264	3271.77	0.24
130-R-2-P	831.49	7	68	831.49	0.00	1592.82	14	669	1594.75	0.12	2543.33	28	2416	2550.95	0.30
150-R-2-D	5351.25	59	2784	5369.33	0.34	4237.66	48	911	4253.30	0.37	3351.26	35	1357	3359.32	0.24
150-R-2-P	858.40	9	27	858.40	0.00	2098.10	21	2152	2098.10	0.00	2999.62	33	1791	3007.45	0.26
average					0.23					0.38					0.33

The notation of Table A.7 is used

Table A.9. Computational Results obtained for the 2|RU|BiVRP configuration of the 2L-BiVRP model

Instance	PD Class 0					PD Class 1					PD Class 2				
	bst	v	t	avg	%g	bst	v	t	avg	%g	bst	v	t	avg	%g
50-C-0-D	1302.82	12	802	1302.82	0.00	1070.72	10	223	1081.55	1.01	811.17	7	2552	811.75	0.07
50-C-0-P	318.70	2	0	318.70	0.00	553.99	4	1	554.97	0.18	837.36	7	939	838.38	0.12
70-C-0-D	1198.45	17	4000	1204.46	0.50	977.55	14	5081	983.92	0.65	794.56	10	1904	794.77	0.03
70-C-0-P	319.90	3	3	319.90	0.00	573.69	6	439	575.04	0.24	754.81	10	1892	756.78	0.26
90-C-0-D	2135.07	22	2466	2146.13	0.52	1767.25	18	2676	1777.30	0.57	1308.59	13	6030	1311.61	0.23
90-C-0-P	457.42	3	5	457.42	0.00	802.57	8	131	802.84	0.03	1245.48	12	1465	1245.94	0.04
110-C-0-D	2077.60	27	8134	2084.49	0.33	1698.43	21	489	1709.41	0.65	1331.66	16	4153	1334.40	0.21
110-C-0-P	454.03	4	28	454.03	0.00	847.03	9	5061	849.28	0.27	1180.52	15	2455	1210.54	2.54
130-C-0-D	2919.96	32	5615	2934.62	0.50	2401.33	26	3643	2414.03	0.53	1894.95	20	6271	1901.55	0.35
130-C-0-P	645.93	5	154	645.93	0.00	1129.99	11	2427	1133.46	0.31	1670.13	17	6172	1681.35	0.67
150-C-0-D	3057.39	36	8132	3095.32	1.24	2464.75	30	5355	2483.38	0.76	2018.22	23	6113	2024.79	0.33
150-C-0-P	701.78	5	13082	702.00	0.03	1183.19	12	5901	1190.66	0.63	1770.15	19	3806	1782.21	0.68
50-C-1-D	1324.53	13	29	1325.79	0.10	1062.10	10	11	1062.10	0.00	893.22	7	506	893.47	0.03
50-C-1-P	294.11	2	0	294.11	0.00	543.83	5	0	543.83	0.00	827.69	7	364	828.10	0.05
70-C-1-D	1114.56	16	1515	1117.52	0.27	1027.57	14	1358	1030.48	0.28	757.91	10	161	759.05	0.15
70-C-1-P	315.97	3	0	315.97	0.00	455.51	5	3	455.51	0.00	739.39	9	340	741.25	0.25
90-C-1-D	2022.32	22	1425	2024.79	0.12	1678.26	18	1271	1684.71	0.38	1298.93	13	508	1299.44	0.04
90-C-1-P	446.14	3	2	446.14	0.00	791.05	7	67	792.29	0.16	1148.24	12	144	1148.36	0.01
110-C-1-D	1954.87	26	1145	1978.02	1.18	1657.89	20	608	1667.21	0.56	1274.54	16	1207	1280.48	0.47
110-C-1-P	413.97	4	1	413.97	0.00	760.36	9	1172	762.35	0.26	1115.86	14	179	1115.92	0.01
130-C-1-D	2749.33	30	1288	2777.75	1.03	2257.01	24	102	2272.76	0.70	1794.09	19	1120	1811.39	0.96
130-C-1-P	560.82	5	1	560.82	0.00	1088.54	10	757	1095.49	0.64	1551.70	16	315	1563.92	0.79
150-C-1-D	2999.63	36	1526	3021.03	0.71	2426.12	29	741	2431.91	0.24	1919.17	22	611	1933.41	0.74
150-C-1-P	661.59	5	101	662.27	0.10	1136.63	12	756	1136.92	0.03	1739.00	19	359	1743.76	0.27
50-C-2-D	1997.17	20	11	1997.17	0.00	1910.45	19	43	1910.45	0.00	1421.52	13	85	1421.52	0.00
50-C-2-P	252.97	2	0	252.97	0.00	579.90	5	0	579.90	0.00	1140.01	11	203	1140.01	0.00
70-C-2-D	1874.59	30	199	1877.32	0.15	1476.72	21	182	1477.24	0.04	1160.09	16	110	1160.09	0.00
70-C-2-P	443.14	5	0	443.14	0.00	838.13	12	23	838.13	0.00	1171.54	19	32	1171.54	0.00
90-C-2-D	3237.63	36	709	3264.68	0.84	2625.30	29	447	2638.81	0.51	1886.81	20	617	1894.63	0.41
90-C-2-P	572.59	6	0	572.59	0.00	1296.23	13	293	1296.24	0.00	1984.30	20	284	1990.16	0.30
110-C-2-D	3817.77	49	955	3842.78	0.66	3057.39	39	468	3073.05	0.51	2263.03	28	102	2272.34	0.41
110-C-2-P	439.43	4	5	439.43	0.00	1155.27	15	36	1155.27	0.00	2043.64	27	174	2044.87	0.06
130-C-2-D	4569.55	52	642	4590.77	0.46	4115.80	45	445	4133.27	0.42	2972.60	32	401	2981.52	0.30
130-C-2-P	862.99	7	12	862.99	0.00	1374.77	13	703	1377.29	0.18	2492.16	27	546	2493.28	0.04
150-C-2-D	4663.62	58	940	4702.66	0.84	3859.76	47	1336	3888.90	0.75	2905.36	34	519	2916.81	0.39
150-C-2-P	928.77	9	1	928.77	0.00	1897.58	19	601	1898.92	0.07	2691.09	32	238	2702.76	0.43
50-R-0-D	1280.18	12	4260	1284.17	0.31	1133.09	10	1525	1134.10	0.09	872.16	7	349	873.63	0.17
50-R-0-P	397.46	2	0	399.15	0.43	580.41	4	182	580.41	0.00	921.48	7	776	921.58	0.01
70-R-0-D	1685.53	17	4197	1698.25	0.75	1411.64	14	674	1418.95	0.52	1134.41	10	1903	1137.86	0.30
70-R-0-P	507.02	3	24	510.47	0.68	827.76	6	123	827.76	0.00	1111.38	10	1123	1112.21	0.07
90-R-0-D	2141.39	23	2147	2158.15	0.78	1830.47	18	6803	1838.22	0.42	1421.14	13	670	1424.86	0.26
90-R-0-P	564.79	3	92	565.43	0.11	924.94	8	2306	934.17	1.00	1319.70	12	2540	1329.71	0.76
110-R-0-D	2585.86	27	4243	2594.19	0.32	2181.22	22	5109	2187.69	0.30	1717.20	16	6807	1723.91	0.39
110-R-0-P	704.11	4	138	705.19	0.15	1196.58	9	4103	1205.07	0.71	1626.20	14	5457	1654.18	1.72
130-R-0-D	3023.11	32	5386	3031.62	0.28	2527.14	26	5233	2545.79	0.74	2021.49	20	945	2038.27	0.83
130-R-0-P	687.48	5	2	687.48	0.00	1289.56	10	4193	1304.75	1.18	1817.87	17	1206	1823.88	0.33
150-R-0-D	3230.87	36	1464	3252.49	0.67	2820.84	30	2834	2838.29	0.62	2198.81	22	10224	2210.85	0.55
150-R-0-P	796.44	5	1224	796.72	0.04	1308.21	11	5026	1317.41	0.70	1987.13	19	5527	1997.43	0.52
50-R-1-D	1302.67	13	81	1302.67	0.00	1091.38	10	132	1094.84	0.32	910.99	7	95	912.50	0.17
50-R-1-P	378.01	2	0	378.01	0.00	665.16	5	7	665.16	0.00	880.78	7	42	881.21	0.05
70-R-1-D	1616.31	17	1709	1616.96	0.04	1411.85	14	988	1413.53	0.12	1107.63	10	244	1110.70	0.28
70-R-1-P	514.68	3	0	514.68	0.00	712.68	5	14	713.17	0.07	1052.32	9	846	1053.84	0.14
90-R-1-D	2090.03	22	1317	2093.33	0.16	1740.53	18	703	1742.52	0.11	1351.63	13	29	1353.77	0.16
90-R-1-P	512.27	3	6	512.27	0.00	883.72	7	258	889.62	0.67	1274.35	11	114	1279.09	0.37
110-R-1-D	2492.95	26	766	2505.31	0.50	2067.96	21	669	2078.62	0.52	1671.42	16	567	1676.60	0.31
110-R-1-P	612.00	4	14	612.00	0.00	1104.66	9	977	1104.66	0.00	1464.31	14	184	1474.44	0.69
130-R-1-D	2884.48	30	757	2903.72	0.67	2409.11	24	257	2418.92	0.41	1918.39	18	1241	1937.98	1.02
130-R-1-P	680.92	5	17	682.49	0.23	1233.93	11	806	1234.75	0.07	1784.87	16	1060	1798.94	0.79
150-R-1-D	3226.71	36	795	3242.76	0.50	2659.66	28	536	2683.77	0.91	2155.16	22	1560	2165.77	0.49
150-R-1-P	726.44	5	1719	726.92	0.07	1325.02	12	1599	1328.18	0.24	1874.77	19	792	1879.15	0.23
50-R-2-D	1994.24	21	120	1994.24	0.00	1844.07	19	8	1844.07	0.00	1377.60	13	173	1377.60	0.00
50-R-2-P	285.43	3	0	285.43	0.00	502.79	5	0	502.79	0.00	1072.68	10	352	1072.68	0.00
70-R-2-D	2609.99	31	514	2609.99	0.00	2119.00	22	475	2119.00	0.00	1556.55	16	504	1556.55	0.00
70-R-2-P	588.32	5	0	588.32	0.00	1080.14	11	18	1080.14	0.00	1731.14	19	99	1731.14	0.00
90-R-2-D	3123.08	36	462	3128.74	0.18	2576.36	29	272	2581.37	0.19	2045.52	22	553	2045.52	0.00
90-R-2-P	709.03	5	1	709.03	0.00	1353.57	13	294	1353.57	0.00	1839.47	20	142	1840.78	0.07
110-R-2-D	4428.03	51	73	4433.53	0.12	3595.77	40	635	3601.68	0.16	2623.00	28	901	2625.52	0.10
110-R-2-P	576.12	4	0	576.12	0.00	1365.34	15	619	1366.34	0.07	2465.46	27	572	2466.41	0.04
130-R-2-D	4767.14	53	668	4779.52	0.26	4111.05	47	462	4118.45	0.18	3141.55	31	280	3164.70	0.74
130-R-2-P	817.68	7	31	817.68	0.00	1540.52	14	1194	1543.20	0.17	2487.37	27	116	2505.77	0.74
150-R-2-D	5210.59	57	335	5232.75	0.43	4120.88	48	270	4141.19	0.49	3214.38	33	1147	3222.71	0.26
150-R-2-P	841.03	9	165	841.03	0.00	2042.03	21	740	2042.03	0.00	2902.94	32	21	2922.75	0.68
average					0.24					0.31					0.35

The notation of Table A.7 is used

Table A.10. Computational Results obtained for the 2|RS|BiVRP configuration of the 2L-BiVRP model

Instance	PD Class 0					PD Class 1					PD Class 2				
	bst	v	t	avg	%g	bst	v	t	avg	%g	bst	v	t	avg	%g
50-C-0-D	1315.28	12	2525	1319.12	0.29	1097.60	10	221	1103.03	0.50	816.74	7	1001	817.32	0.07
50-C-0-P	318.70	2	0	318.70	0.00	555.03	5	1	555.03	0.00	839.89	7	3722	840.15	0.03
70-C-0-D	1209.98	17	5015	1217.65	0.63	999.19	14	6098	999.95	0.08	798.65	10	1052	799.60	0.12
70-C-0-P	319.90	3	1	319.90	0.00	576.48	6	3651	576.48	0.00	765.90	10	4575	773.48	0.99
90-C-0-D	2145.51	23	963	2147.04	0.07	1777.41	19	7935	1790.85	0.76	1338.97	14	11191	1341.93	0.22
90-C-0-P	457.42	3	22	457.42	0.00	802.57	8	1556	802.57	0.00	1246.74	12	9045	1247.17	0.03
110-C-0-D	2089.18	27	12142	2095.30	0.29	1734.83	22	5030	1750.52	0.90	1383.46	17	3412	1385.05	0.12
110-C-0-P	454.03	4	5	454.03	0.00	852.64	9	10001	856.44	0.45	1202.46	15	13381	1234.57	2.67
130-C-0-D	2940.39	33	6450	2948.35	0.27	2425.64	27	2999	2431.98	0.26	1904.40	20	7796	1910.21	0.31
130-C-0-P	645.93	5	115	645.93	0.00	1131.73	11	5339	1138.94	0.64	1686.39	17	10392	1699.19	0.76
150-C-0-D	3109.86	36	5654	3137.11	0.88	2522.10	31	8748	2531.86	0.39	2034.96	23	8508	2043.12	0.40
150-C-0-P	702.63	6	5236	702.85	0.03	1193.63	12	207	1200.71	0.59	1779.12	19	9489	1791.65	0.70
50-C-1-D	1332.60	13	512	1332.60	0.00	1072.32	10	1561	1072.32	0.00	905.70	8	140	905.70	0.00
50-C-1-P	294.11	2	0	294.11	0.00	548.30	5	562	548.30	0.00	828.50	7	841	833.21	0.57
70-C-1-D	1124.75	17	2368	1124.75	0.00	1038.22	14	2517	1040.87	0.26	761.22	10	2084	761.24	0.00
70-C-1-P	328.30	3	1	328.30	0.00	459.01	5	713	459.01	0.00	756.07	9	362	770.01	1.84
90-C-1-D	2068.51	22	3981	2089.07	0.99	1698.43	18	2011	1709.21	0.63	1329.58	14	905	1331.05	0.11
90-C-1-P	449.52	3	174	449.52	0.00	800.28	7	1781	800.56	0.03	1156.35	12	1755	1157.44	0.09
110-C-1-D	1998.96	27	3143	2002.41	0.17	1681.01	21	2163	1684.69	0.22	1299.99	16	1894	1310.61	0.82
110-C-1-P	414.26	4	9	414.26	0.00	765.98	9	3464	766.48	0.07	1127.96	14	1817	1131.21	0.29
130-C-1-D	2839.67	31	1953	2860.54	0.73	2319.71	25	2433	2328.79	0.39	1825.06	19	1798	1830.40	0.29
130-C-1-P	565.55	5	31	565.55	0.00	1108.35	11	3612	1109.31	0.09	1638.85	17	1072	1649.26	0.63
150-C-1-D	3072.70	37	4166	3094.33	0.70	2461.94	29	4137	2475.14	0.54	1956.12	22	2071	1966.63	0.54
150-C-1-P	667.88	5	4543	671.95	0.61	1151.52	12	3870	1160.14	0.75	1789.78	19	527	1799.45	0.54
50-C-2-D	2038.29	21	49	2038.29	0.00	1910.86	18	115	1910.95	0.00	1433.42	13	172	1433.42	0.00
50-C-2-P	258.37	2	0	258.37	0.00	580.77	5	0	580.77	0.00	1141.20	11	249	1141.20	0.00
70-C-2-D	1876.64	30	66	1878.59	0.10	1480.14	21	1063	1480.18	0.00	1163.43	16	604	1163.43	0.00
70-C-2-P	443.14	5	0	443.14	0.00	841.39	12	18	841.39	0.00	1175.03	19	115	1175.03	0.00
90-C-2-D	3291.80	36	725	3312.68	0.63	2628.73	29	678	2650.17	0.82	1892.50	20	1188	1904.60	0.64
90-C-2-P	577.70	6	2	577.70	0.00	1306.96	13	63	1306.96	0.00	1994.35	20	1051	2005.48	0.56
110-C-2-D	3846.77	50	743	3881.47	0.90	3060.70	39	328	3068.83	0.27	2267.73	28	226	2285.20	0.77
110-C-2-P	446.04	4	24	446.04	0.00	1155.27	15	104	1155.27	0.00	2048.39	27	32	2048.39	0.00
130-C-2-D	4571.98	52	426	4592.86	0.46	4137.33	45	187	4146.47	0.22	2983.76	33	395	2985.80	0.07
130-C-2-P	862.99	7	29	862.99	0.00	1384.55	13	305	1390.21	0.41	2494.28	27	1073	2494.41	0.01
150-C-2-D	4676.52	58	325	4714.51	0.81	3876.03	47	1468	3887.17	0.29	2913.51	34	906	2924.16	0.37
150-C-2-P	928.77	9	3	928.77	0.00	1903.89	19	655	1905.08	0.06	2719.24	33	129	2722.91	0.13
50-R-0-D	1298.02	13	3922	1298.02	0.00	1148.94	10	5808	1149.45	0.04	883.73	7	7791	883.73	0.00
50-R-0-P	397.46	2	1	397.46	0.00	588.68	4	13	588.68	0.00	935.48	7	272	935.48	0.00
70-R-0-D	1702.35	18	5340	1702.54	0.01	1425.53	14	8625	1427.80	0.16	1162.69	11	4961	1171.82	0.78
70-R-0-P	507.02	3	12	507.02	0.00	827.76	6	151	827.76	0.00	1122.54	10	5120	1131.03	0.76
90-R-0-D	2159.01	23	2908	2159.10	0.00	1867.23	19	5737	1877.10	0.53	1436.46	14	6889	1436.93	0.03
90-R-0-P	564.79	3	31	564.79	0.00	933.97	8	2812	933.97	0.00	1320.78	12	10288	1331.87	0.84
110-R-0-D	2608.89	27	7319	2624.00	0.58	2194.35	22	4455	2196.88	0.12	1740.99	17	8413	1745.14	0.24
110-R-0-P	704.11	4	3	704.11	0.00	1204.31	10	4011	1204.31	0.00	1657.00	15	5378	1664.81	0.47
130-R-0-D	3042.46	32	715	3054.12	0.38	2571.10	27	13681	2590.77	0.77	2053.32	20	2077	2060.18	0.33
130-R-0-P	690.68	5	336	690.68	0.00	1313.72	11	7309	1329.77	1.22	1834.94	17	6787	1844.44	0.41
150-R-0-D	3273.90	37	2426	3284.57	0.33	2850.45	31	12185	2870.83	0.72	2231.55	23	21449	2239.52	0.36
150-R-0-P	802.64	6	309	802.68	0.00	1327.71	12	7642	1329.61	0.14	2002.28	19	7472	2024.23	1.10
50-R-1-D	1337.33	13	715	1338.72	0.10	1115.57	10	1576	1122.52	0.62	941.13	8	450	941.13	0.00
50-R-1-P	378.01	2	1	378.01	0.00	671.65	5	24	671.65	0.00	895.96	7	2369	896.60	0.07
70-R-1-D	1640.78	17	1881	1641.55	0.05	1446.69	14	3956	1455.96	0.64	1129.60	10	4075	1129.60	0.00
70-R-1-P	528.02	3	65	528.02	0.00	723.94	5	2267	723.94	0.00	1083.90	10	674	1083.92	0.00
90-R-1-D	2119.16	22	1722	2131.91	0.60	1777.45	18	1829	1782.02	0.26	1375.72	13	2682	1389.76	1.02
90-R-1-P	514.42	3	37	514.42	0.00	912.19	7	537	913.53	0.15	1299.86	12	2465	1299.91	0.00
110-R-1-D	2562.08	27	1110	2571.18	0.35	2118.93	21	4976	2132.35	0.63	1694.57	16	2924	1700.99	0.38
110-R-1-P	618.03	4	3	618.03	0.00	1120.54	9	3347	1121.29	0.07	1497.12	14	2765	1507.52	0.69
130-R-1-D	2959.81	31	1629	2969.72	0.33	2496.64	25	7433	2513.66	0.68	1957.89	19	3575	1969.28	0.58
130-R-1-P	686.96	5	1333	686.96	0.00	1256.82	11	1325	1260.86	0.32	1839.28	17	3497	1850.78	0.63
150-R-1-D	3304.34	37	4621	3325.40	0.64	2745.32	29	2634	2770.12	0.90	2208.39	23	3665	2215.45	0.32
150-R-1-P	738.03	5	259	738.03	0.00	1360.37	12	5809	1373.93	1.00	1920.06	19	4170	1928.56	0.44
50-R-2-D	1998.18	21	14	1998.18	0.00	1860.54	19	18	1860.54	0.00	1383.72	13	66	1383.72	0.00
50-R-2-P	285.43	3	0	285.43	0.00	538.26	5	6	538.26	0.00	1080.60	10	403	1080.60	0.00
70-R-2-D	2610.48	31	86	2610.48	0.00	2121.91	22	479	2121.91	0.00	1567.94	16	2	1567.94	0.00
70-R-2-P	588.32	5	0	588.32	0.00	1107.43	11	24	1107.43	0.00	1740.38	19	66	1740.38	0.00
90-R-2-D	3135.27	36	676	3138.28	0.10	2599.17	29	1044	2601.09	0.07	2072.63	22	906	2075.27	0.13
90-R-2-P	725.46	5	5	725.46	0.00	1372.42	13	232	1372.75	0.02	1859.08	21	369	1859.57	0.03
110-R-2-D	4436.54	51	199	4445.47	0.20	3608.69	40	649	3612.02	0.09	2647.77	28	249	2657.14	0.35
110-R-2-P	581.46	4	0	581.46	0.00	1383.57	15	549	1383.57	0.00	2482.50	27	777	2486.31	0.15
130-R-2-D	4797.83	54	430	4806.08	0.17	4134.98	47	634	4143.74	0.21	3161.78	31	757	3179.86	0.57
130-R-2-P	817.68	7	20	817.68	0.00	1561.86	14	66	1562.13	0.02	2525.87	28	150	2533.57	0.30
150-R-2-D	5247.23	58	659	5258.98	0.22	4140.43	48	492	4153.91	0.33	3250.14	34	924	3252.31	0.07
150-R-2-P	858.40	9	3	858.40	0.00	2046.88	21	687	2046.88	0.00	2928.75	32	384	2947.94	0.66
average					0.18					0.27					0.37

The notation of Table A.7 is used