Electronic Supplementary Material

Enhanced solution representations for vehicle routing problems with split deliveries

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The following e-companion (EC) reports detailed computational results of the FTS algorithm on the benchmark instances of the split delivery vehicle routing problem (SDVRP), the multidepot SDVRP (MDSDVRP) and the SDVRP with time windows (SDVRPTW).

EC 1: Detailed results on the SDVRP

In this section, we report the detailed computational results for the SDVRP.

Table S1 reports details about the programming languages and the machines used by the different algorithms proposed in the literature for the SDVRP. Column "SuperPi (1M)" gives a performance evaluation in seconds of the corresponding machine according to the SuperPi (1M) benchmark (http://www.superpi.net/). The computing time of SuperPi is an estimate of the single-thread speed of a CPU — the less computing time that a CPU takes, the faster the CPU is. The SuperPi (1M) score of the machine used in our experiments is equal to about 9 seconds, hence our machine is about as fast as the machine used for SplitILS (Silva et al., 2015).

Table S1 Details of state-of-the-art algorithms for the SDVRP

Algorithm	Reference	Language	Machine	SuperPi (1M)
SPLITABU	Archetti et al. (2006)	C++	Pentium IV 2.4 GHz + 256 MB RAM	90
VRTR + EMIP	Chen et al. (2007)	C++	Pentium IV 1.7 GHz + 512 MB RAM	120
OH	Archetti et al. (2008)	C++	–	–
ICA + VND	Aleman et al. (2010)	C#	Pentium IV 2.8 GHz	66
TSVBA	Aleman and Hill (2010)	C#	Pentium IV 2.8 GHz	66
ABHC	Derigs et al. (2010)	–	CPU 3.0 GHz + 2 GB RAM	44
BPCH	Archetti et al. (2011a)	C++	Intel Dual Core 2.4 GHz + 3 GB RAM	25
RGTS	Berbotto et al. (2013)	C++	CPU 2.1 GHz + 4 GB RAM	100
SplitILS	Silva et al. (2015)	C++	Intel Core i7 2.93 GHz + 8 GB RAM	10
SRC + VND	Han and Chu (2016)	C#	Intel Core i7 3.4 GHz + 16 GB RAM	9

Tables S2–S4 give detailed results about the three set of SDVRP instances, respectively. These tables show the following columns: The number of customers ("*n*"), the cost of the best known solution ("BKS"), and for each algorithm, the average cost of the solutions computed over the ten runs ("Cost"), and the corresponding average computing time ("Time"). The solution values marked with bold numbers are about values less than or equal to the BKS values: An asterisk "*" indicates that the value reported is strictly less than the BKS value.

Table S2 SDVRP: Detailed results on Set 1 instances

Instance	*n*	BKS	FTS		SplitILS		BPCH	ICA + VND		RGTS		TSVBA	
			Cost	Time	Cost	Time	Cost	Cost	Time	Cost	Time	Cost	Time
S51D1	51	459.5	**459.5**	24	**459.5**	1	**459.5**	473.2	5	**459.5**	12	468.8	14
S51D2	51	708.4	708.5	28	709.3	11	717.2	732.4	4	724.0	1	718.7	32
S51D3	51	948.0	948.2	31	948.1	16	960.4	1001.2	3	970.7	3	969.8	19
S51D4	51	1561.3	1562.8	53	1562.0	56	1569.9	1708.0	3	1614.1	15	1628.2	20
S51D5	51	1333.7	1333.9	42	**1333.7**	37	1339.4	1404.5	2	1381.7	4	1362.2	15
S51D6	51	2169.1	2186.2	90	**2169.1**	63	2182.1	2230.1	2	2213.9	2	2236.2	14
S76D1	51	598.9	**598.9**	56	**598.9**	5	633.8	610.2	64	629.6	98	613.7	252
S76D2	51	1087.4	1087.5	53	**1087.4**	69	1104.6	1169.8	8	1113.4	9	1128.2	60
S76D3	51	1427.8	1428.2	64	1427.9	97	1435.1	1490.1	12	1460.0	13	1472.9	51
S76D4	51	2079.8	2083.5	90	**2079.8**	188	2106.6	2220.9	7	2103.1	13	2180.1	54
S101D1	51	726.6	727.8	69	**726.6**	16	791.1	765.5	10	791.2	119	749.9	860
S101D2	51	1378.4	1378.6	66	**1378.4**	152	1426.2	1445.0	26	1415.9	24	1409.0	220
S101D3	51	1874.8	1876.6	110	**1874.8**	317	1911.1	1990.3	28	1907.9	21	1947.6	132
S101D5	51	2790.7	2797.5	147	2791.2	572	2824.2	2999.3	18	2896.0	14	2910.7	131
Average	51	1367.5	1369.8	66	1367.6	114	1390.1	1445.7	14	1405.8	25	1414.0	134

Table S3 SDVRP: Detailed results on Set 2 instances

Instance	*n*	BKS	FTS		SplitILS		BPCH	ICA+VND		VRTR+EMIP		TSVBA		RGTS		ABHC	
			Cost	Time	Cost	Time	Cost	Cost	Time	Cost	Time	Cost	Time	Cost	Time	Cost	Time
SD1	8	228.3	**228.3**	0	**228.3**	0	**228.3**	**228.3**	1	**228.3**	1	**228.3**	5	**228.3**	0	**228.3**	300
SD2	16	708.3	**708.3**	2	**708.3**	1	**708.3**	**708.3**	0	714.4	54	**708.3**	0	**708.3**	0	**708.3**	300
SD3	16	430.4	430.6	2	430.6	1	**430.4**	430.6	0	430.6	67	430.6	0	430.6	0	430.6	300
SD4	24	630.6	631.1	9	631.1	2	**630.6**	635.8	1	631.1	400	631.0	2	634.0	0	631.1	300
SD5	32	1389.9	1390.6	23	1390.6	6	**1389.9**	1390.6	1	1408.1	403	1390.6	1	1401.3	3	1390.6	300
SD6	32	830.9	831.2	20	831.2	6	**830.9**	831.2	1	831.2	408	831.2	4	846.2	2	831.2	300
SD7	40	3640.0	**3640.0**	35	**3640.0**	14	**3640.0**	**3640.0**	1	3714.4	403	**3640.0**	1	**3640.0**	3	**3640.0**	300
SD8	48	5068.3	**5068.3**	47	**5068.3**	25	**5068.3**	**5068.3**	2	5200.0	404	**5068.3**	1	**5068.3**	2	**5068.3**	300
SD9	48	2042.9	2044.2	46	2044.2	39	**2042.9**	2071.0	3	2059.8	404	2071.0	11	2044.7	1	2067.8	300
SD10	64	2683.7	2684.9	65	2684.9	101	**2683.7**	2747.8	4	2749.1	400	2747.3	11	2701.5	6	2784.2	300
SD11	80	13280.0	**13280.0**	192	**13280.0**	152	**13280.0**	**13280.0**	4	13612.1	400	**13280.0**	5	**13280.0**	15	**13280.0**	300
SD12	80	7213.6	7217.2	155	**7213.6**	211	7239.6	7280.0	4	7399.1	408	**7213.6**	18	**7213.6**	19	7220.4	300
SD13	96	10105.9	10110.6	213	10110.6	189	**10105.9**	10110.6	6	10367.1	405	10110.6	9	10129.5	61	10277.8	300
SD14	120	10717.5	10735.6	330	**10717.5**	480	10725.4	10893.5	15	11023.0	5022	10802.9	79	10783.0	41	10790.6	3600
SD15	144	15094.5	15122.2	400	**15094.5**	732	15129.7	15168.3	18	15271.8	5042	15153.5	50	15151.1	110	15152.9	3600
SD16	144	3379.3	3381.3	157	3381.3	931	**3379.3**	3635.3	40	3449.1	5015	3446.4	238	3481.2	54	3381.3	3600
SD17	160	26493.6	26555.6	400	26496.1	577	26533.4	26559.9	17	26665.8	5024	**26493.6**	88	26512.5	130	26536.1	3600
SD18	160	14202.5	14217.5	400	**14202.5**	835	14283.5	14440.6	40	14546.6	5029	14323.0	213	14293.5	61	14469.1	3600
SD19	192	19995.7	20094.6	400	**19995.7**	1525	20374.7	20191.2	28	20559.2	5034	20157.1	190	20131.9	310	20420.1	3600
SD20	240	39635.5	39866.7	400	**39635.5**	1563	40265.3	39813.5	63	40408.2	5053	39722.9	388	39702.0	560	40368.6	3600
SD21	288	11271.1	11271.0*	400	11345.7	5035	11440.5	11799.6	738	11491.7	5051	11458.8	2533	11365.2	371	11271.1	3600
Average	-	9002.0	9024.3	176	9006.2	592	9067.2	9091.6	47	9179.1	2116	9043.3	183	9035.6	83	9092.8	1557

Table S4 SDVRP: Detailed results on Set 3 instances

Instance	*n*	BKS	FTS		SplitILS		ABHC	BPCH	RGTS		SPLITABU	OH
			Cost	Time	Cost	Time	Cost	Cost	Cost	Time	Cost	Cost
p01	50	524.6	524.6	23	524.6	2	524.6	-	529.2	12	530.8	527.7
p01 D1	50	459.5	459.5	21	459.5	1	-	459.5	466.9	17	462.9	-
p01 D2	50	756.7	756.7	26	757.2	13	776.4	770.2	784.6	4	765.3	758.2
p01 D3	50	1005.8	1005.8	27	1005.8	21	1012.6	1017.2	1025.0	1	1039.1	1021.0
p01 D4	50	1488.4	1487.6*	46	1488.6	43	1489.6	1489.4	1503.3	1	1512.0	1497.2
p01 D5	50	1481.7	1481.9	44	1481.7	44	1488.3	1499.3	1503.2	8	1503.9	1502.0
p01 D6	50	2155.8	2166.2	79	2156.1	78	2174.5	2166.3	2195.7	4	2173.6	2166.8
p02	75	823.9	823.9	45	823.9	30	829.9	-	864.6	11	854.3	853.6
p02 D1	75	617.9	618.3	40	617.9	6	-	652.9	629.1	19	623.9	-
p02 D2	75	1109.6	1109.7	43	1109.6	53	1124.0	1121.8	1146.2	8	1134.1	1122.9
p02 D3	75	1502.1	1503.7	49	1502.1	108	1508.7	1514.4	1550.4	13	1556.7	1548.5
p02 D4	75	2298.3	2298.8	98	2298.6	207	2340.1	2318.3	2398.4	17	2338.7	2337.8
p02 D5	75	2219.5	2222.3	94	2220.0	265	2243.9	2237.2	2240.0	12	2293.5	2263.1
p02 D6	75	3223.4	3236.1	185	3223.4	379	3266.8	3258.2	3259.4	10	3285.4	3250.4
p03	100	826.1	827.4	56	826.1	41	826.1	-	846.0	31	841.4	840.1
p03 D1	100	760.0	760.2	58	760.0	22	-	788.2	805.0	123	771.5	-
p03 D2	100	1458.5	1458.8	80	1458.5	180	1478.6	1477.4	1491.8	29	1515.2	1505.5
p03 D3	100	1996.8	1998.4	99	1996.8	362	2035.9	2040.9	2062.5	53	2054.1	2024.6
p03 D4	100	3085.7	3101.2	188	3085.7	737	3145.3	3127.1	3171.6	52	3155.2	3136.3
p03 D5	100	2988.4	2994.8	158	2989.3	743	3014.1	3030.7	3091.3	49	3070.9	3055.5
p03 D6	100	4387.3	4431.0	324	4387.3	675	4447.5	4467.6	4465.0	84	4470.7	4452.6
p04	150	1023.7	1025.8	116	1023.9	234	1028.4	-	1059.7	488	1070.9	1055.1
p04 D1	150	921.5	923.5	119	921.9	162	-	984.7	979.7	433	947.1	-
p04 D2	150	2016.9	2017.8	161	2017.0	1110	2055.2	2066.5	2093.2	135	2101.8	2093.3
p04 D3	150	2849.7	2852.3	227	2849.7	1519	2912.1	2917.8	2943.5	179	2991.6	2977.0
p04 D4	150	4543.2	4573.1	400	4545.5	2410	4638.7	4678.5	4652.1	214	4674.1	4659.9
p04 D5	150	4334.7	4362.2	400	4334.7	2358	4436.0	4438.8	4460.2	255	4496.9	4465.5
p04 D6	150	6393.2	6479.5	400	6395.4	1926	6467.2	6523.2	6511.5	198	6482.2	6462.8
p05	199	1283.3	1287.9	198	1289.9	1355	1302.9	-	1368.8	654	1340.4	1338.4
p05 D1	199	1074.2	1078.5	199	1074.2	626	-	1268.8	1158.1	1011	1148.3	-
p05 D2	199	2477.4	2484.4	310	2478.4	2661	2540.1	2596.9	2571.0	313	2585.8	2582.6
p05 D3	199	3471.3	3489.3	400	3471.4	3015	3581.7	3568.2	3592.8	247	3624.2	3594.0
p05 D4	199	5520.7	5578.9	400	5521.6	4350	5669.3	5673.2	5798.4	232	5715.8	5710.2
p05 D5	199	5403.4	5452.1	400	5409.8	4524	5541.1	5560.3	5556.0	201	5571.1	5549.8
p05 D6	199	8188.2	8307.5	400	8192.0	3258	8297.7	8410.4	8319.4	223	8392.1	8355.5
p11	120	1037.9	1046.0	99	1037.9	85	1042.1	-	1043.9	1121	1057.0	1057.0
p11 D1	120	1042.9	1043.7	105	1043.2	110	-	1071.6	1099.3	1201	1055.3	-
p11 D2	120	2898.5	2899.4	129	2898.5	895	2913.1	2983.8	2939.4	104	3060.5	3017.9
p11 D3	120	4218.5	4221.7	216	4219.0	1957	4270.4	4259.9	4301.5	139	4502.6	4476.4
p11 D4	120	6854.0	6876.1	297	6854.1	3442	6890.4	6995.9	6967.5	304	7350.1	7117.2
p11 D5	120	6652.6	6670.9	304	6674.0	2354	6671.0	6822.3	6770.1	178	7168.3	7126.8
p11 D6	120	10132.5	10262.7	400	10204.8	2280	10233.4	10376.9	10132.5	39	10673.3	10429.8
Average	-	2799.5	2814.3	178	2800.7	1063	-	-	2865.4	201	2903.9	-

EC 2: Detailed results on the MDSDVRP

In this section, we report detailed computational results for the MDSDVRP. Table S5 presents the details of the programming languages and machines used by the different algorithms proposed in the literature for the MDSDVRP. Tables S6 and S7 provide the detailed results for the two sets of MDSDVRP instances, respectively. These tables show the following columns: The number of customers ("*n*"), the number of depots ("*m*"), and for each algorithm the average cost of the solutions computed over the ten runs ("Cost") and the corresponding average computing time ("Time") (when available). For our algorithm, the tables also provide the number of vehicles used in the solutions ("NV"). The solution values marked in bold are the best values computed using the algorithms.

Table S5 Details of state-of-the-art algorithms for the MDSDVRP

Algorithm	Reference	Language	Machine
VES	Gulczynski et al. (2011)	C++	Pentium IV 3.0 GHz + 512 MB RAM
IDH	Gulczynski et al. (2011)	C++	Pentium IV 3.0 GHz + 512 MB RAM
HP	Ray et al. (2014)	-	-

Table S6 MDSDVRP: Detailed results on Set 1 instances

Instance	*n*	*m*	FTS			VES	IDH		HP	
			Cost	NV	Time	Cost	Cost	Time	Cost	Time
SQ1	32	2	1056.6	25	185.6	1057.7	1063.1	638.2	1048	1.0
SQ2	48	3	1588.2	37	312.2	1588.5	1601.0	634.5	1588	1.1
SQ3	64	4	2123.2	49	400.0	2131.4	2142.1	559.6	2116	2.6
SQ4	80	5	2653.9	62	400.0	2662.2	2684.0	604.3	2665	5.6
SQ5	64	2	3407.1	49	400.0	3422.2	3434.7	646.8	3446	8.6
SQ6	96	3	5117.4	73	400.0	5135.3	5142.1	653.1	5153	24.4
SQ7	128	4	6835.0	98	400.0	6860.4	6969.1	924.8	6929	57.9
SQ8	160	5	8582.8	122	400.0	8573.5	8600.6	928.2	8638	101.6
SQ9	96	2	7035.1	73	400.0	7050.6	7109.7	696.7	7047	41.1
SQ10	144	3	10599.0	110	400.0	10577.9	10586.5	939.8	10587	127.8
SQ11	192	4	14128.2	147	400.0	14117.2	14135.8	947.9	14152	302.8
SQ12	240	5	17656.2	184	400.0	17644.6	17739.6	940.9	17780	566.8
Average	-	-	6731.9	-	374.8	6735.1	6767.4	759.6	6762.4	103.4

Table S7 MDSDVRP: Detailed results on Set 2 instances

Instance	*n*	*m*	Demand interval	FTS			IDH	
				Cost	NV	Time	Cost	Time
MDSD1	50	4	[0.1, 0.9]	995.84	29	237.8	1018.22	635.0
			[0.3, 0.7]	956.54	27	260.3	990.85	614.9
			[0.7, 0.9]	1332.06	44	400.0	1344.99	614.6
MDSD2	75	5	[0.1, 0.9]	1271.68	43	285.7	1289.06	687.6
			[0.3, 0.7]	1204.76	38	288.8	1223.57	682.0
			[0.7, 0.9]	1712.09	65	400.0	1705.98	680.5
MDSD3	100	2	[0.1, 0.9]	2571.20	48	400.0	2624.41	654.6
			[0.3, 0.7]	2526.27	50	400.0	2558.33	657.8
			[0.7, 0.9]	3867.67	81	400.0	3878.34	660.6
MDSD4	100	2	[0.1, 0.9]	2360.43	53	400.0	2393.23	639.7
			[0.3, 0.7]	2320.90	50	400.0	2336.65	651.3
			[0.7, 0.9]	3477.85	82	400.0	3525.24	645.5
MDSD5	100	3	[0.1, 0.9]	1935.72	52	400.0	1963.13	656.1
			[0.3, 0.7]	1855.37	50	385.4	1871.47	665.3
			[0.7, 0.9]	2739.25	82	400.0	2772.58	649.4
MDSD6	100	4	[0.1, 0.9]	1913.47	54	400.0	1963.68	657.1
			[0.3, 0.7]	1827.27	52	400.0	1887.48	689.1
			[0.7, 0.9]	2674.72	85	400.0	2696.47	664.1
MDSD7	249	2	[0.1, 0.9]	15910.21	122	400.0	16096.91	953.6
			[0.3, 0.7]	16024.68	124	400.0	16136.07	944.1
			[0.7, 0.9]	25034.38	204	400.0	25502.49	937.6
MDSD8	249	3	[0.1, 0.9]	13159.39	122	400.0	13258.26	969.7
			[0.3, 0.7]	13279.96	125	400.0	13444.18	948.8
			[0.7, 0.9]	20639.76	204	400.0	20915.02	987.4
MDSD9	249	4	[0.1, 0.9]	11703.12	123	400.0	11959.27	960.8
			[0.3, 0.7]	12050.49	125	400.0	12176.61	942.4
			[0.7, 0.9]	18478.00	203	400.0	18844.77	987.1
MDSD10	249	5	[0.1, 0.9]	11150.65	124	400.0	11377.3	938.8
			[0.3, 0.7]	11546.80	125	400.0	11831.52	980.6
			[0.7, 0.9]	17450.08	203	400.0	17777.76	961.7
Average	-	-	-	7465.69	-	381.9	7578.79	777.2

EC 3: Detailed results on the SDVRPTW

In this section, we report detailed computational results for the SDVRPTW. Tables S8 and S9 provide the detailed results for the two sets of SDVRPTW instances, respectively. The tables show the average cost of the solutions computed over ten runs ("Cost") and the corresponding average computing time ("Time") (when available). For all algorithms, the tables also provide the number of vehicles used in the solutions ("NV"). The solution values marked in bold are the best values computed using the algorithms.

Table S8 SDVRPTW: Detailed results on Set 1 instances

R1								R2							
Instance	VRPTW-EA		FTS			TSH		Instance	VRPTW-EA		FTS			TSH	
	Cost	NV	Cost	NV	Time	Cost	NV		Cost	NV	Cost	NV	Time	Cost	NV
R101	1645.79	19	1643.9	20	38	1648.96	20	R201	1252.37	4	1153.93	9	52	1236.93	5
R102	1486.12	17	1475.4	18	33	1506.08	18	R202	1191.7	3	1055.67	7	49	1138.91	4
R103	1292.68	13	1239.89	15	36	1276.58	14	R203	939.54	3	926.47	5	43	911.87	4
R104	1007.24	9	993.78	11	32	1059.42	11	R204	825.52	2	816.28	3	50	844.13	4
R105	1377.11	14	1364.78	15	39	1448.89	15	R205	994.42	3	974.43	5	46	1035.57	4
R106	1251.98	12	1252.38	13	45	1282.5	14	R206	906.14	3	900.48	4	45	990.42	3
R107	1104.66	10	1090.57	12	39	1229.47	11	R207	893.33	2	816.72	3	50	909.18	3
R108	960.88	9	969.35	10	37	962.33	10	R208	726.75	2	719.71	3	44	766.37	3
R109	1194.73	11	1154	13	41	1241.21	13	R209	909.16	3	878.9	5	52	966.11	3
R110	1118.59	10	1072.41	12	40	1212.11	13	R210	939.34	3	938.2	5	57	950.99	4
R111	1096.72	10	1053.5	12	41	1098.37	12	R211	892.71	2	775.66	4	44	833.47	3
R112	982.14	9	969.87	10	33	1000.12	11								
Average	1209.89	11.9	1189.99	13.4	38	1247.17	13.5	Average	951.91	2.7	905.13	4.8	48	962.18	3.6
C1								C2							
Instance	VRPTW-EA		FTS			TSH		Instance	VRPTW-EA		FTS			TSH	
	Cost	NV	Cost	NV	Time	Cost	NV		Cost	NV	Cost	NV	Time	Cost	NV
C101	828.94	10	828.94	10	29	828.94	10	C201	591.56	3	591.56	3	39	591.56	3
C102	828.94	10	828.94	10	34	840.3	10	C202	591.56	3	591.56	3	43	591.56	3
C103	828.06	10	828.06	10	42	834.56	10	C203	591.17	3	600.21	3	40	591.17	3
C104	824.78	10	829.66	10	38	855.3	10	C204	590.6	3	614.95	3	45	612.51	3
C105	828.94	10	828.94	10	32	828.94	10	C205	588.88	3	609.36	3	46	588.88	3
C106	828.94	10	828.94	10	29	828.94	10	C206	588.49	3	588.49	3	43	588.49	3
C107	828.94	10	828.94	10	31	828.94	10	C207	588.29	3	615.31	4	41	588.29	3
C108	828.94	10	828.94	10	34	828.94	10	C208	588.32	3	588.32	3	45	588.35	3
C109	828.94	10	828.94	10	39	828.94	10								
Average	828.38	-	828.92	-	34	833.76	-	Average	589.86	-	599.97	-	43	592.60	-
RC1								RC2							
Instance	VRPTW-EA		FTS			TSH		Instance	VRPTW-EA		FTS			TSH	
	Cost	NV	Cost	NV	Time	Cost	NV		Cost	NV	Cost	NV	Time	Cost	NV
RC101	1696.94	14	1646.96	16	33	1743.32	16	RC201	1406.91	4	1278.22	8	44	1375.94	5
RC102	1554.75	12	1537.56	15	37	1564.88	15	RC202	1367.09	3	1151.49	6	48	1283.78	4
RC103	1261.67	11	1290	12	33	1303.4	12	RC203	1049.62	3	974.42	5	49	1142.61	4
RC104	1135.48	10	1156.2	10	36	1203.85	11	RC204	798.41	3	802.25	4	47	867.72	3
RC105	1629.44	13	1558.53	16	33	1629.84	17	RC205	1297.19	4	1204.34	8	54	1345.87	5
RC106	1424.73	11	1392.02	13	34	1459.59	13	RC206	1146.32	3	1060.78	6	50	1121.4	4
RC107	1230.48	11	1233.52	12	32	1282.58	12	RC207	1061.14	3	1002.28	6	48	1045.55	4
RC108	1139.82	10	1138.93	11	33	1268.03	11	RC208	828.14	3	787.17	5	61	987.41	3
Average	1384.16	-	1369.22	-	34	1431.94	-	Average	1119.35	-	1032.62	-	50	1146.29	-

Table S9 SDVRPTW: Detailed results on Set 2 instances

	R1						R2					
(l, u)	FTS			TSH			FTS			TSH		
	Cost	NV	Time	Cost	NV	Gap (%)	Cost	NV	Time	Cost	NV	Gap (%)
(0.01, 0.05)	1429.33	18.8	73.3	1471.49	18.3	2.9	1362.58	18.1	91.8	1430.62	18.0	5.0
(0.02, 1.00)	2233.39	36.1	348.3	2291.46	35.0	2.6	2206.56	36.0	392.5	2318.04	35.0	5.1
(0.50, 1.00)	3789.02	68.2	400.0	4040.67	67.0	6.6	3786.63	68.4	400.0	4059.26	68.0	7.2
(0.70, 1.00)	4396.01	81.4	400.0	4581.54	79.0	4.2	4402.91	81.7	400.0	4574.17	80.0	3.9
	C1						C2					
(l, u)	FTS			TSH			FTS			TSH		
	Cost	NV	Time	Cost	NV	Gap (%)	Cost	NV	Time	Cost	NV	Gap (%)
(0.01, 0.05)	1053.54	12.1	50.8	1182.12	12.2	12.2	1065.21	11.3	84.6	1174.29	11.1	10.2
(0.02, 1.00)	1730.70	22.9	271.7	2168.57	22.2	25.3	1740.10	22.3	351.0	1995.59	22.0	14.7
(0.50, 1.00)	3836.91	61.0	400.0	3979.78	61.0	3.7	4038.31	61.0	400.0	4268.02	61.0	5.7
(0.70, 1.00)	4768.78	77.1	400.0	4962.28	77.0	4.1	4946.82	77.4	400.0	5246.12	77.0	6.1
	RC1						RC2					
(l, u)	FTS			TSH			FTS			TSH		
	Cost	NV	Time	Cost	NV	Gap (%)	Cost	NV	Time	Cost	NV	Gap (%)
(0.01, 0.05)	1895.39	21.6	74.8	1965.05	20.1	3.7	1873.90	21.0	113.2	1946.07	20.0	3.9
(0.02, 1.00)	3258.18	42.0	400.0	3339.20	40.0	2.5	3267.68	42.0	400.0	3419.85	39.0	4.7
(0.50, 1.00)	5130.66	71.1	400.0	5453.10	70.0	6.3	5134.80	71.4	400.0	5546.20	71.0	8.0
(0.70, 1.00)	5894.94	83.4	400.0	6095.20	81.0	3.4	5889.84	83.5	400.0	6155.49	82.0	4.5