

Orphans: none

Total distance: 11260

## C.2 Problem class *R2*

The following output was generated by *MATLAB* for the problem class *R2*: randomly distributed customers with a long scheduling horizon.

```
Tour:      1
Vehicle: v1
Route:     1
Customer  Actual time
c11       0.00
c821      25.00
c651      37.89
c571      80.00
c321      91.02
c611     102.25
c691     113.27
c681     124.73
c191     134.89
c91      145.62
c201     216.00
c481     240.00
c521     411.00
c601     891.00
c711     903.53
c501    1226.00
c861    1313.00
c732    2254.00
c11     2265.07
```

```
Tour:      2
Vehicle: v2
Route:     1
Customer  Actual time
c11       0.00
c841      43.00
c241      54.65
c421      64.82
c51      138.00
```

c351	148.31
c751	158.58
c631	168.95
c171	180.35
c781	192.44
c461	203.89
c1011	234.00
c981	245.25
c341	255.95
c531	266.38
c951	407.00
c41	558.00
c831	1482.00
c642	2204.00
c11	2215.02

Tour: 3  
Vehicle: v3  
Route: 1

Customer	Actual time
c11	0.00
c741	274.00
c401	285.93
c801	298.05
c371	309.56
c921	365.00
c621	377.44
c181	389.55
c271	400.24
c961	411.56
c361	424.93
c721	438.00
c851	476.00
c511	514.00
c221	524.84
c471	765.00
c121	866.00
c151	952.00
c261	1195.00
c882	2152.00
c11	2162.69

Tour: 4  
Vehicle: v4

Route: 1

Customer	Actual time
c11	0.00
c441	129.00
c931	211.00
c661	295.00
c71	378.00
c381	390.87
c491	402.62
c891	440.00
c331	575.00
c291	588.51
c411	602.38
c161	631.00
c451	720.00
c391	859.00
c281	900.00
c141	1009.00
c11	1020.89

Route: 2

Customer	Actual time
c11	1020.89
c671	1022.42
c431	1035.18
c251	1047.15
c761	1058.44
c61	1102.00
c971	1112.96
c591	1124.09
c771	1136.75
c231	1149.56
c991	1160.71
c101	1173.76
c582	1186.09
c811	1196.95
c901	1207.91
c311	1219.07
c81	1231.36
c561	1428.00
c32	1552.00
c11	1563.16

Route: 3

Customer	Actual time
c11	1563.16

c212	1615.00
c131	1625.55
c111	1636.85
c551	1691.00
c702	1797.00
c541	1807.91
c912	1818.78
c1002	1938.00
c22	1973.00
c872	1985.36
c11	1995.89

Tour: 5  
Vehicle: v5  
Route: 1

Customer	Actual time
c11	0.00
c791	656.00
c301	1030.00
c942	1414.00
c11	1426.11

Orphans: none

Total distance: 8722

### C.3 Problem class C1

The following output was generated by *MATLAB* for the problem class C1: clustered customers with a short scheduling horizon.

Tour: 1  
Vehicle: v1  
Route: 1

Customer	Actual time
c11	0.00
c141	15.00
c791	105.16
c721	196.13
c391	287.38
c551	378.27
c231	469.25
c11	561.02

Route: 2  
Customer Actual time  
c11 561.02  
c801 595.00  
c1011 686.33  
c681 777.25  
c181 867.35  
c402 957.42  
c82 1049.42  
c11 1141.38

Tour: 2  
Vehicle: v2  
Route: 1  
Customer Actual time  
c11 0.00  
c221 72.00  
c241 162.16  
c511 252.67  
c531 343.07  
c132 435.24  
c11 526.33

Route: 2  
Customer Actual time  
c11 526.33  
c291 527.31  
c152 617.53  
c751 723.00  
c881 813.76  
c162 904.31  
c542 996.04  
c992 1087.42  
c11 1179.67

Tour: 3  
Vehicle: v3  
Route: 1  
Customer Actual time  
c11 0.00  
c631 23.00  
c451 113.11  
c201 203.44  
c811 294.58  
c322 384.62

c261	474.67
c11	565.49

Route: 2

Customer	Actual time
c11	565.49
c712	577.00
c522	668.13
c662	764.00
c372	856.76
c842	976.00
c11	1067.45

Route: 3

Customer	Actual time
c11	1067.45
c642	1079.00
c572	1169.15
c11	1260.75

Tour: 4

Vehicle: v4

Route: 1

Customer	Actual time
c11	0.00
c461	19.00
c911	109.95
c111	219.00
c441	314.00
c471	405.15
c921	496.65
c11	587.87

Route: 2

Customer	Actual time
c11	587.87
c381	602.00
c821	692.07
c892	855.00
c501	945.45
c11	1037.36

Tour: 5

Vehicle: v5

Route: 1

Customer	Actual time
c11	0.00

c741 35.00  
c671 125.38  
c481 215.42  
c31 306.58  
c871 398.91  
c11 491.36

Route: 2

Customer	Actual time
c11	491.36
c71	492.25
c342	583.51
c101	674.51
c22	764.55
c1002	854.58
c932	947.04
c11	1039.00

Tour: 6

Vehicle: v6

Route: 1

Customer	Actual time
c11	0.00
c211	33.00
c421	123.15
c861	213.20
c251	311.00
c971	401.71
c691	492.11
c11	582.78

Route: 2

Customer	Actual time
c11	582.78
c772	583.33
c412	704.00
c312	794.49
c431	885.36
c11	977.02

Route: 3

Customer	Actual time
c11	977.02
c122	979.00
c11	1069.91

Tour: 7

Vehicle: v7

Route: 1

Customer	Actual time
c11	0.00
c941	51.00
c171	141.80
c192	232.51
c591	322.91
c362	413.62
c982	505.33
c782	650.00
c11	740.80

Route: 2

Customer	Actual time
c11	740.80
c652	741.29
c352	833.29
c962	923.33
c11	1014.84

Tour: 8

Vehicle: v8

Route: 1

Customer	Actual time
c11	0.00
c611	77.00
c831	167.13
c301	285.00
c851	378.82
c731	561.00
c52	651.04
c11	743.00

Route: 2

Customer	Actual time
c11	743.00
c582	744.29
c902	895.00
c602	985.13
c11	1076.35

Tour: 9

Vehicle: v9

Route: 1

Customer	Actual time
----------	-------------



c11	0.00
c331	84.00
c271	201.00
c761	291.89
c701	508.00
c622	599.44
c11	689.87

Route: 2

Customer	Actual time
c11	689.87
c62	754.00
c92	950.00
c11	1042.35

Tour: 10  
Vehicle: v10  
Route: 1

Customer	Actual time
c11	0.00
c491	70.00
c281	178.00
c951	517.00
c11	609.44

Tour: 11  
Vehicle: v11  
Route: 1

Customer	Actual time
c11	0.00
c561	79.00
c41	169.87
c11	262.18

Orphans: none

Total distance: 7330

## C.4 Problem class C2

The following output was generated by *MATLAB* for the problem class C2: clustered customers with a long scheduling horizon.

Tour: 1

Vehicle: v1

Route: 1

Customer	Actual time
c11	0.00
c791	11.00
c891	101.31
c381	191.91
c411	282.95
c991	373.42
c741	465.58
c391	557.40
c671	648.07
c191	739.51
c271	829.64
c171	921.25
c91	1012.95
c41	1104.56
c292	1195.44
c321	1287.13
c701	1377.56
c481	1469.38
c761	1560.84
c442	1651.24
c542	1742.60
c981	1883.00
c772	3202.00
c11	3293.18

Route: 2

Customer	Actual time
c11	3293.18
c62	3295.20
c692	3387.84
c11	3478.45

Tour: 2

Vehicle: v2

Route: 1

Customer	Actual time
c11	0.00
c51	57.00
c451	147.73
c721	238.42
c111	330.42
c201	422.13

c421	513.07
c841	604.33
c301	694.73
c31	784.91
c831	877.18
c461	968.98
c162	1061.24
c341	1153.42
c492	1245.47
c901	1336.65
c261	1427.89
c911	1517.91
c942	1610.05
c211	1702.51
c811	1919.00
c152	3298.00
c11	3389.13

Tour: 3

Vehicle: v3

Route: 1

Customer	Actual time
c11	0.00
c371	7.00
c681	97.62
c331	188.13
c431	279.56
c641	370.80
c1011	462.31
c951	553.58
c1001	643.69
c711	733.75
c361	824.71
c471	915.82
c881	1006.95
c611	1098.45
c141	1189.35
c131	1279.40
c231	1371.65
c931	1462.67
c921	1554.60
c511	1646.42
c972	1736.95
c251	1920.00

c11 2010.31  
Route: 2  
Customer Actual time  
c11 2010.31  
c752 2012.11  
c501 2120.00  
c241 2211.00  
c622 2301.75  
c181 2392.45  
c562 2483.33  
c862 2573.49  
c82 2664.38  
c572 2756.27  
c802 2849.44  
c22 2941.40  
c531 3032.42  
c962 3123.78  
c352 3214.82  
c11 3306.00

Tour: 4  
Vehicle: v4  
Route: 1  
Customer Actual time  
c11 0.00  
c651 78.00  
c71 273.00  
c401 365.25  
c601 457.27  
c871 547.44  
c661 640.05  
c631 731.25  
c581 933.00  
c781 1024.35  
c311 1117.00  
c852 1421.00  
c281 1516.00  
c731 1608.11  
c521 1699.36  
c101 1817.00  
c821 2094.00  
c221 2211.00  
c591 2304.00  
c551 2395.33

```
c121    2910.00
c11     3000.58
```

Orphans: none

Total distance: 7240

## C.5 Problem class *RC1*

The following output was generated by *MATLAB* for the problem class *RC1*: both randomly distributed, and clustered customers with a short scheduling horizon.

```
Tour:    1
Vehicle: v1
Route:   1
Customer Actual time
  c11      0.00
  c441     79.00
  c492    524.00
  c11     534.87
Route:   2
Customer Actual time
  c11     534.87
  c762    549.00
  c11     560.84
Vehicle: v2
Tour:    2
Vehicle: v2
Route:   1
Customer Actual time
  c11      0.00
  c251     52.00
  c961     63.04
  c372    550.00
  c11     561.07
Vehicle: v3
Tour:    3
Vehicle: v3
Route:   1
Customer Actual time
  c11      0.00
  c701     53.00
```

c591 172.00  
 c982 446.00  
 c11 457.00  
 Route: 2  
 Customer Actual time  
 c11 457.00  
 c402 473.00  
 c682 501.00  
 c11 511.29

Tour: 4  
 Vehicle: v4  
 Route: 1  
 Customer Actual time  
 c11 0.00  
 c431 10.00  
 c471 138.00  
 c212 438.00  
 c11 449.53

Route: 2  
 Customer Actual time  
 c11 449.53  
 c652 482.00  
 c842 498.00  
 c11 509.84

Tour: 5  
 Vehicle: v5  
 Route: 1  
 Customer Actual time  
 c11 0.00  
 c711 101.00  
 c201 114.20  
 c312 485.00  
 c11 495.67

Tour: 6  
 Vehicle: v6  
 Route: 1  
 Customer Actual time  
 c11 0.00  
 c571 41.00  
 c862 420.00  
 c11 431.69

Tour: 7  
Vehicle: v7  
Route: 1  
Customer Actual time  
c11 0.00  
c451 206.00  
c912 230.00  
c11 241.29

Route: 2  
Customer Actual time  
c11 241.29  
c512 257.00  
c172 299.00  
c422 416.00  
c11 426.85

Tour: 8  
Vehicle: v8  
Route: 1  
Customer Actual time  
c11 0.00  
c932 222.00  
c11 232.36

Route: 2  
Customer Actual time  
c11 232.36  
c722 234.00  
c11 245.60

Route: 3  
Customer Actual time  
c11 245.60  
c952 258.00  
c462 268.45  
c242 291.00  
c11 302.73

Route: 4  
Customer Actual time  
c11 302.73  
c832 356.00  
c582 411.00  
c11 421.73

Tour: 9

Vehicle: v9

Route: 1

Customer	Actual time
c11	0.00
c851	51.00
c121	156.00
c882	232.00
c11	243.13

Route: 2

Customer	Actual time
c11	243.13
c382	261.00
c222	287.00
c342	334.00
c11	345.49

Route: 3

Customer	Actual time
c11	345.49
c742	347.11
c362	357.75
c972	372.00
c11	382.91

Route: 4

Customer	Actual time
c11	382.91
c22	411.00
c612	421.05
c11	432.49

Tour: 10

Vehicle: v10

Route: 1

Customer	Actual time
c11	0.00
c781	72.00
c91	97.00
c142	337.00
c11	348.56

Route: 2

Customer	Actual time
c11	348.56
c182	349.58
c672	372.00
c11	382.78



Route: 3  
Customer Actual time  
c11 382.78  
c352 383.71  
c32 396.00  
c11 407.13

Tour: 11  
Vehicle: v11  
Route: 1  
Customer Actual time  
c11 0.00  
c641 26.00  
c261 117.00  
c941 376.00  
c11 387.60

Route: 2  
Customer Actual time  
c11 387.60  
c772 391.00  
c11 401.95

Tour: 12  
Vehicle: v12  
Route: 1  
Customer Actual time  
c11 0.00  
c661 65.00  
c552 374.00  
c11 384.44

Tour: 13  
Vehicle: v13  
Route: 1  
Customer Actual time  
c11 0.00  
c81 57.00  
c811 90.00  
c922 263.00  
c11 274.87

Route: 2  
Customer Actual time  
c11 274.87  
c802 281.00

c822	303.00
c792	314.80
c11	325.35

Tour: 14  
Vehicle: v14  
Route: 1

Customer	Actual time
c11	0.00
c531	42.00
c321	52.09
c752	318.00
c11	329.98

Tour: 15  
Vehicle: v15  
Route: 1

Customer	Actual time
c11	0.00
c871	161.00
c562	283.00
c11	294.25

Route: 2

Customer	Actual time
c11	294.25
c272	299.00
c11	310.56

Tour: 16  
Vehicle: v16  
Route: 1

Customer	Actual time
c11	0.00
c41	83.00
c162	310.00
c11	321.24

Tour: 17  
Vehicle: v17  
Route: 1

Customer	Actual time
c11	0.00
c291	15.00
c151	68.00

c72 202.00  
c11 212.45

Tour: 18  
Vehicle: v18  
Route: 1

Customer	Actual time
c11	0.00
c51	9.00
c501	51.00
c11	61.49

Route: 2

Customer	Actual time
c11	61.49
c412	70.00
c232	192.00
c11	203.04

Tour: 19  
Vehicle: v19  
Route: 1

Customer	Actual time
c11	0.00
c541	15.00
c391	110.00
c11	121.78

Route: 2

Customer	Actual time
c11	121.78
c61	123.33
c301	135.93
c112	190.00
c11	201.98

Tour: 20  
Vehicle: v20  
Route: 1

Customer	Actual time
c11	0.00
c621	101.00
c992	176.00
c11	186.82

Tour: 21

Vehicle: v21  
Route: 1  
Customer Actual time  
c11 0.00  
c1011 32.00  
c902 164.00  
c11 174.76

Tour: 22  
Vehicle: v22  
Route: 1  
Customer Actual time  
c11 0.00  
c481 30.00  
c631 40.95  
c11 52.51

Route: 2  
Customer Actual time  
c11 52.51  
c601 72.00  
c1002 104.00  
c11 116.09

Route: 3  
Customer Actual time  
c11 116.09  
c892 117.40  
c11 128.71

Route: 4  
Customer Actual time  
c11 128.71  
c282 144.00  
c11 155.47

Tour: 23  
Vehicle: v23  
Route: 1  
Customer Actual time  
c11 0.00  
c131 58.00  
c332 121.00  
c11 132.80

Route: 2  
Customer Actual time  
c11 132.80

c732 135.00  
c11 145.76  
Route: 3  
Customer Actual time  
c11 145.76  
c102 153.00  
c11 163.93

Tour: 24  
Vehicle: v24  
Route: 1  
Customer Actual time  
c11 0.00  
c521 127.00  
c11 138.71

Tour: 25  
Vehicle: v25  
Route: 1  
Customer Actual time  
c11 0.00  
c691 70.00  
c11 81.33  
c11 81.33

Tour: 26  
Vehicle: v26  
Route: 1  
Customer Actual time  
c11 0.00  
c191 82.00  
c11 93.29  
c11 93.29

Orphans: none

Total distance: 8706

## C.6 Problem class *RC2*

The following output was generated by my *MATLAB* for the problem class *RC1*: both randomly distributed, and clustered customers with a long

scheduling horizon.

Tour: 1

Vehicle: v1

Route: 1

Customer	Actual time
c11	0.00
c411	26.00
c431	38.05
c161	136.00
c961	146.64
c251	209.00
c372	2255.00
c11	2266.07

Tour: 2

Vehicle: v2

Route: 1

Customer	Actual time
c11	0.00
c51	9.00
c851	144.00
c321	156.04
c701	210.00
c91	387.00
c141	588.00
c762	2194.00
c11	2205.84

Tour: 3

Vehicle: v3

Route: 1

Customer	Actual time
c11	0.00
c481	61.00
c631	71.95
c291	83.15
c801	180.00
c441	314.00
c492	2100.00
c11	2110.87

Tour: 4

Vehicle: v4

Route: 1  
Customer Actual time  
c11 0.00  
c891 212.00  
c661 223.60  
c721 432.00  
c591 689.00  
c982 1783.00  
c11 1794.00

Route: 2  
Customer Actual time  
c11 1794.00  
c212 1795.53  
c652 1926.00  
c402 1936.93  
c682 2004.00  
c472 2015.64  
c11 2027.13

Tour: 5  
Vehicle: v5  
Route: 1  
Customer Actual time  
c11 0.00  
c931 44.00  
c81 229.00  
c911 383.00  
c201 420.00  
c711 433.20  
c451 825.00  
c842 1992.00  
c11 2003.84

Tour: 6  
Vehicle: v6  
Route: 1  
Customer Actual time  
c11 0.00  
c551 36.00  
c181 587.00  
c312 1940.00  
c11 1950.67

Tour: 7

Vehicle: v7

Route: 1

Customer	Actual time
c11	0.00
c1011	69.00
c831	79.20
c531	108.00
c131	231.00
c121	623.00
c882	927.00
c11	938.13

Route: 2

Customer	Actual time
c11	938.13
c512	1028.00
c952	1038.25
c462	1048.71
c382	1059.53
c421	1070.38
c242	1165.00
c342	1336.00
c11	1347.49

Route: 3

Customer	Actual time
c11	1347.49
c742	1349.11
c752	1362.71
c972	1488.00
c941	1503.00
c352	1514.36
c362	1525.44
c11	1537.44

Route: 4

Customer	Actual time
c11	1537.44
c672	1538.22
c612	1605.00
c582	1644.00
c22	1656.07
c862	1682.00
c11	1693.69

Tour: 8

Vehicle: v8



Route: 1

Customer	Actual time
c11	0.00
c541	15.00
c31	197.00
c641	207.98
c61	324.00
c772	1564.00
c11	1574.95

Tour: 9

Vehicle: v9

Route: 1

Customer	Actual time
c11	0.00
c731	211.00
c501	221.89
c811	358.00
c521	507.00
c922	1054.00
c11	1065.87

Route: 2

Customer	Actual time
c11	1065.87
c562	1132.00
c792	1204.00
c222	1215.47
c172	1226.49
c822	1237.11
c11	1248.36

Tour: 10

Vehicle: v10

Route: 1

Customer	Actual time
c11	0.00
c781	230.00
c71	241.51
c191	329.00
c601	340.60
c261	470.00
c272	1196.00
c11	1207.56

Tour: 11  
Vehicle: v11  
Route: 1

Customer	Actual time
c11	0.00
c571	148.00
c101	180.00
c1001	209.00
c331	328.00
c391	439.00
c11	450.78

Route: 2

Customer	Actual time
c11	450.78
c991	451.60
c621	462.56
c41	473.69
c282	576.00
c232	768.00
c11	779.04

Tour: 12  
Vehicle: v12  
Route: 1

Customer	Actual time
c11	0.00
c151	270.00
c901	417.00
c691	428.65
c301	513.00
c871	646.00
c11	657.56

Route: 2

Customer	Actual time
c11	657.56
c112	760.00
c11	771.98

Orphans: none

Total distance: 7748