

APPENDIX A

POINT TO MULTIPOINT ROUTING PROBLEM

ILLUSTRATION FOR ROUTING CASE 1

Illustration results of Case 1 using VNS algorithms. Data from Christensen *et al.* (1997) shown in Table A1. The best Steiner tree found is presented in Table A2 and illustrated in Figure A. Note that best result reported in Christensen *et al.* (1997) is 253 units.

Table A1

Request	Source	Destination(s)	Capacity
R1	B	C, H	5
R2	D	B, H	3
R3	G	E, F, B	4
R4	A	G	2

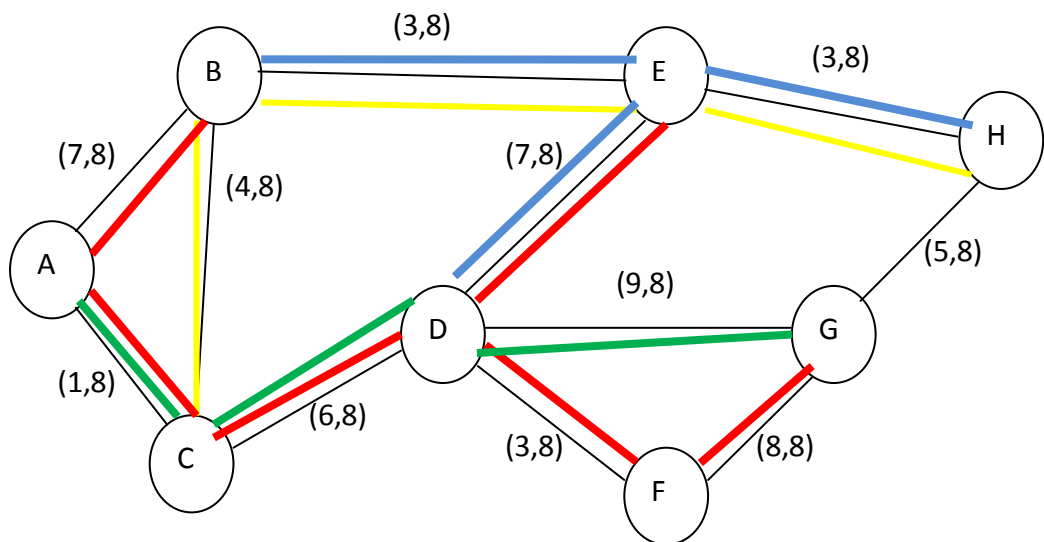


Figure A: Minimum Steiner Tree found using the algorithm represented by different colour in Table A2.

TABLE A2: R1 is request 1 (yellow), R2 is request 2 (blue), R3 is request 3 (red) and R4 is request 4 (green).

REQUEST	R1	R2	R3	R4
Min Steiner Tree	B→E E→H B→C	B→E E→H E→D	A→C C→D D→F F→G D→E A→B	A→C C→D D→G

Order for best results using VNS4 for Third Test:

NUM OF REQUEST	BEST ORDER
4R	1 4 3 2
5R	1 4 3 5 2, 2 5 1 3 4, 1 4 3 2 5
6R	2 5 3 6 1 4, 2 3 6 5 1 4, 2 5 3 1 6 4, 5 2 1 3 6 4
7R	5 2 3 4 6 1 7, 2 3 6 4 5 7 1, 2 3 6 5 4 1 7, 2 3 5 4 6 1 7, 5 2 3 6 4 1 7, 2 3 4 6 5 1 7
8R	8 2 1 3 4 7 6 5
9R	8 7 4 5 2 1 3 9 6, 7 4 8 5 2 1 3 9 6
10R	1 4 2 10 5 3 8 7 9 6, 1 8 5 2 4 6 10 7 9 3, 1 5 2 6 4 10 7 8 9 3, 1 5 6 8 2 3 4 10 7 9, 1 2 6 4 10 5 8 7 3 9, 1 4 5 6 2 10 8 3 7 9
11R	5 4 3 7 1 6 11 10 8 9 2
12R	6 4 7 3 5 10 1 9 2 11 8 12
13R	3 8 9 6 1 4 13 10 5 11 12 2 7
14R	1 4 2 10 7 5 3 9 11 8 13 6 12 14
15R	6 2 11 3 5 15 10 9 7 1 4 8 12 13 14
16R	3 11 16 12 7 14 1 2 5 15 6 4 9 8 13
17R	17 2 3 6 1 16 10 4 9 13 7 15 8 11 12 14
18R	3 18 6 16 7 9 15 17 10 13 8 1 5 4 14 11 2 12
19R	19 4 3 1 10 2 16 11 6 9 8 18 7 14 12 13 15 5 17
20R	6 20 3 16 4 13 11 10 5 9 1 8 7 18 14 19 12 2 17 15

APPENDIX B

INTEGRATED INVENTORY ROUTING PROBLEM

DATA

CASE : S12T14 (12 Suppliers 14 Periods)

Fixed Vehicle Cost	20
Vehicle Capacity	10
Travel Cost Per Unit Distance	1

		Coordinate	
		X	Y
Supplier	D	0	0
	1	9	50
	2	-9	10
	3	-22	22
	4	-4	40
	5	-3	44
	6	-40	12
	7	-5	-5
	8	-15	-15
	9	-8	-2
	10	10	-10
	11	20	-5
	12	20	-19
	AP	10	20

D : DEPOT

AP : ASSEMBLY PLANT

Supplier	Holding Cost
1	24
2	15
3	3
4	9
5	12
6	9
7	6
8	27
9	27
10	9
11	15
12	18

DEMAND		Period													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
Supplier	1	4	2	4	4	4	4	4	4	4	4	4	4	4	4
	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	3	2	1	2	2	2	2	2	2	2	2	2	2	2	2
	4	2	1	2	2	2	2	2	2	2	2	2	2	2	2
	5	1	2	1	1	1	1	1	1	1	1	1	1	1	1
	6	4	2	4	4	4	4	4	4	4	4	4	4	4	4
	7	2	1	2	2	2	2	2	2	2	2	2	2	2	2
	8	2	1	2	2	2	2	2	2	2	2	2	2	2	2
	9	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	10	1	2	1	1	1	1	1	1	1	1	1	1	1	1
	11	4	1	4	4	4	4	4	4	4	4	4	4	4	4
	12	2	1	2	2	2	2	2	2	2	2	2	2	2	2

CASE : S20T21 (20 Suppliers 21 Periods)

Fixed Vehicle Cost 20
 Vehicle Capacity 10
 Travel Cost Per Unit Distance 1

		Coordinate	
		X	Y
Supplier	D	0	0
	1	9	50
	2	0	50
	3	44	44
	4	-9	10
	5	-22	22
	6	-4	40
	7	-3	44
	8	-4	39
	9	-40	12
	10	-19	19
	11	-7	-5
	12	-5	-5
	13	-12	-12
	14	-15	-15
	15	-8	-2
	16	10	-10
	17	5	-5
	18	20	-5
	19	20	-19
	20	9	-9
	AP	10	20

Supplier	Holding Cost
1	24
2	27
3	27
4	15
5	3
6	9
7	12
8	6
9	9
10	9
11	6
12	6
13	18
14	27
15	27
16	9
17	12
18	15
19	18
20	12

DEMAND		Period																				
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Supplier	1	4	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	3	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	4	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	5	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	6	4	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
	7	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	8	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	9	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	10	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	11	4	1	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
	12	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	13	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	14	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	15	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	16	4	1	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
	17	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	18	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	19	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	20	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

CASE : S50T21 (50 Suppliers 21 Periods)

Fixed Vehicle Cost 20
 Vehicle Capacity 10
 Travel Cost Per Unit Distance 1

		Coordinate	
		X	Y
Supplier	D	0	0
	1	9	50
	2	8	45
	3	0	50
	4	15	15
	5	12	9
	6	44	44
	7	50	10
	8	-9	10
	9	-5	15
	10	-12	12
	11	-22	22
	12	-19	10
	13	-4	40
	14	-2	10
	15	-1	19
	16	-3	44
	17	-9	9
	18	-4	39
	19	-22	12
	20	-33	12
	21	-40	12
	22	-30	20
	23	-19	19
	24	-3	19
	25	-4	9
	26	-7	-5
	27	-9	-9
	28	-5	-5
	29	-19	-5
	30	-14	-9
	31	-12	-12
	32	-14	-14
	33	-15	-15
	34	-9	-1
	35	-7	-8
	36	-8	-2
	37	12	-8
	38	10	-10
	39	20	-12
	40	7	-11
	41	5	-5
	42	4	-12
	43	20	-5
	44	9	-22
	45	11	-11
	46	20	-19
	47	4	-4
	48	9	-9
	49	12	-2
	50	10	-17
	AP	10	20

Supplier	Holding Cost
1	8
2	1
3	9
4	2
5	4
6	9
7	5
8	5
9	4
10	6
11	1
12	3
13	3
14	3
15	7
16	4
17	4
18	2
19	2
20	3
21	3
22	3
23	3
24	2
25	5
26	2
27	5
28	2
29	4
30	2
31	6
32	1
33	9
34	3
35	2
36	9
37	5
38	3
39	5
40	3
41	4
42	1
43	5
44	8
45	3
46	6
47	4
48	4
49	5
50	2

DEMAND		Period																				
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Supplier	1	4	1	0	0	4	0	4	0	4	2	4	4	0	0	4	4	0	4	4	4	4
	2	2	0	2	2	2	2	0	2	2	2	2	2	2	2	0	2	2	2	2	2	2
	3	2	1	2	2	7	2	2	0	0	2	7	0	2	2	2	2	2	2	2	2	2
	4	0	2	0	0	0	0	2	2	2	2	0	0	2	0	2	2	0	2	2	2	2
	5	1	3	1	1	1	1	1	1	1	7	2	1	1	1	1	2	1	1	1	1	1
	6	4	4	0	4	4	4	0	4	0	4	4	2	0	4	4	0	4	0	4	0	4
	7	7	1	2	0	2	7	2	2	2	0	2	2	2	7	0	2	0	2	2	2	2
	8	2	0	2	0	0	2	2	0	0	0	2	2	2	2	0	2	2	2	0	0	2
	9	0	0	2	0	2	2	2	2	2	2	0	2	0	2	2	0	2	2	2	2	2
	10	1	1	1	1	1	0	1	1	2	0	1	1	0	1	1	1	1	0	1	1	1
	11	4	0	4	4	4	4	0	4	4	0	4	0	2	4	4	4	4	0	4	4	4
	12	2	1	0	0	2	2	0	2	0	0	2	2	2	2	7	2	2	2	0	2	0
	13	2	2	2	2	2	2	2	0	0	2	0	0	2	2	2	2	2	2	2	2	2
	14	2	2	0	2	2	2	2	2	2	2	2	2	0	2	2	2	2	2	0	2	2
	15	0	0	7	1	1	1	1	7	1	1	1	1	1	0	1	0	0	1	1	0	1
	16	0	5	4	4	4	0	4	0	4	0	2	4	2	7	0	7	4	4	4	4	0
	17	2	7	0	0	0	2	2	2	2	2	2	2	0	2	2	2	2	2	7	2	2
	18	2	1	0	2	2	2	2	2	2	2	0	0	7	0	2	0	0	2	0	2	0
	19	2	2	2	2	0	2	2	2	7	2	2	2	2	2	2	2	2	2	2	2	2
	20	0	0	0	1	1	0	0	1	1	1	1	1	1	1	0	1	0	0	1	1	1
	21	4	0	0	0	4	4	4	0	4	4	4	4	0	4	0	4	4	4	4	4	0
	22	5	0	2	7	0	5	0	0	0	5	5	5	5	5	0	5	5	0	5	2	5
	23	2	5	0	2	0	2	2	2	2	2	2	0	2	2	2	2	7	2	2	0	2
	24	0	0	0	9	0	0	7	9	0	9	0	9	9	0	9	9	2	9	9	9	9
	25	4	0	0	4	0	0	4	4	4	0	2	4	2	4	4	4	4	0	4	0	4
	26	3	0	3	0	2	3	3	3	3	3	0	0	0	2	3	3	3	0	0	3	3
	27	4	0	4	4	4	4	0	4	4	4	4	4	4	4	0	7	4	2	4	7	4
	28	4	2	4	4	4	4	4	2	4	2	4	0	4	4	4	4	0	4	4	4	4
	29	2	1	2	0	0	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0
	30	0	3	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0
	31	3	0	3	2	3	3	0	7	3	3	7	2	3	0	3	3	3	3	3	3	3
	32	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0
	33	2	1	0	2	7	2	2	2	0	2	2	2	2	2	2	2	2	2	2	2	2
	34	0	0	1	1	1	1	2	1	2	0	1	1	2	1	1	1	1	0	1	1	1
	35	0	0	5	5	0	5	5	5	5	5	0	5	5	0	5	5	5	0	5	5	0
	36	2	2	2	2	2	2	2	2	2	2	2	2	2	0	2	0	0	2	2	0	7
	37	1	1	1	0	0	7	1	1	1	0	0	1	1	1	1	1	1	1	0	1	1
	38	1	1	0	1	1	1	0	1	1	1	1	0	0	1	0	1	0	1	0	1	1
	39	3	7	3	3	3	2	3	3	3	3	3	3	3	3	3	2	3	3	0	3	0
	40	2	2	2	2	2	0	2	2	2	7	0	2	2	2	2	2	2	2	2	2	2
	41	1	0	0	0	1	1	1	1	0	0	1	1	1	0	1	0	0	1	1	0	1
	42	7	4	7	4	2	0	0	4	4	4	0	0	4	4	2	4	4	4	4	4	4
	43	1	0	1	1	1	1	1	0	1	0	0	1	2	7	0	1	2	1	1	0	1
	44	0	5	5	2	0	5	5	0	5	0	0	5	0	5	5	0	5	5	5	2	5
	45	2	2	2	0	2	2	2	2	0	2	7	2	0	2	2	2	2	2	7	0	2
	46	1	0	0	1	2	1	1	1	1	1	1	0	1	1	1	7	0	1	1	1	0
	47	0	0	2	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2	2	0	0
	48	4	2	4	4	4	4	2	4	4	4	4	4	4	4	4	4	4	4	0	4	4
	49	3	3	0	3	0	3	3	3	3	3	0	0	7	0	0	3	3	0	3	0	2
	50	2	0	2	2	0	2	2	2	2	0	2	2	2	2	2	2	2	2	0	2	0

CASE : S98T14 (98 Suppliers 14 Periods)

Fixed Vehicle Cost 200
 Vehicle Capacity 400
 Travel Cost Per Unit Distance 50

		Coordinate	
		X	Y
Supplier	D	0	0
	1	42.93	-85.2
	2	42.33	-83.49
	3	42.85	-82.92
	4	42.47	-83.46
	5	42.46	-83.4
	6	41.92	-79.69
	7	44.24	-83.59
	8	40.73	-85.15
	9	41.83	-89.48
	10	44.75	-85.7
	11	40.94	-83.39
	12	39.97	-82.51
	13	44.24	-85.54
	14	42.37	-83.37
	15	43.49	-83.38
	16	41.48	-84.58
	17	42.69	-85.96
	18	40.09	-82.98
	19	42.33	-83.19
	20	41.46	-87.69
	21	41.41	-83.65
	22	38.94	-85.88
	23	43.01	-86.14
	24	42.82	-86.13
	25	43.42	-85.74
	26	42.51	-83.06
	27	40.74	-86.04
	28	42.2	-83.62
	29	40.2	-75.35
	30	41.4	-81.83
	31	42.67	-83
	32	42.37	-83.54
	33	42.85	-85.99
	34	41.05	-82.51
	35	39.56	-84.21
	36	42.46	-83.18
	37	41.25	-87.43
	38	40.55	-84.39
	39	40.82	-81.5
	40	42.32	-84.39
	41	42.84	-83.2
	42	38.8	-85.42
	43	42.42	-83.1
	44	38.67	-88.5
	45	42.03	-88.24
	46	42.79	-83.6
	47	41.44	-81.03
	48	40.21	-77.01
	49	42.26	-85.51

		Coordinate	
		X	Y
Supplier	50	42.76	-83.74
	51	42.17	-83.48
	52	41.65	-85.6
	53	42.66	-83.12
	54	42.06	-83.92
	55	42.59	-83.51
	56	40.8	-81.98
	57	40.28	-84.16
	58	40.29	-81.89
	59	40.86	-83.87
	60	45.34	-84.89
	61	42.33	-83.08
	62	40.42	-91.03
	63	42.47	-83
	64	42.32	-89
	65	42.11	-86.36
	66	41.24	-81.92
	67	42.65	-83.72
	68	41.38	-81.53
	69	41.33	-85.02
	70	41.44	-84.72
	71	42.68	-83.24
	72	41.69	-86.15
	73	42.25	-85.79
	74	42.16	-84.03
	75	43.85	-84.72
	76	41.44	-81.54
	77	42.52	-83.16
	78	41.15	-85.48
	79	42.88	-85.55
	80	39.03	-82.66
	81	42.98	-82.47
	82	42.47	-83.29
	83	40.87	-82.32
	84	42.03	-86.45
	85	41.99	-83.95
	86	42.11	-85.47
	87	40.88	-84.59
	88	39.46	-83.84
	89	43.19	-85.26
	90	38.03	-87.58
	91	42.69	-82.82
	92	43.25	-82.54
	93	42.46	-82.9
	94	39.84	-88.95
	95	41.48	-85.6
	96	37.98	-87.48
	97	42.51	-82.94
	98	42.7	-82.55
	AP	42.31	-83.17

Supplier	Holding Cost
1	5
2	1
3	9
4	12
5	5
6	5
7	38
8	4
9	1
10	3
11	12
12	12
13	5
14	3
15	1
16	9
17	22
18	3
19	3
20	3
21	2
22	9
23	12
24	15
25	19
26	1
27	26
28	3
29	2
30	2
31	4
32	3
33	2
34	1
35	1
36	4
37	9
38	12
39	44
40	2
41	3
42	4
43	3
44	11
45	9
46	22
47	4
48	4
49	4

Supplier	Holding Cost
50	2
51	1
52	12
53	23
54	4
55	7
56	4
57	2
58	1
59	3
60	3
61	11
62	10
63	3
64	1
65	22
66	27
67	3
68	4
69	1
70	3
71	3
72	25
73	15
74	18
75	8
76	10
77	3
78	20
79	19
80	3
81	4
82	20
83	3
84	5
85	6
86	23
87	5
88	5
89	1
90	6
91	2
92	6
93	9
94	7
95	4
96	3
97	4
98	4

DEMAND		Period													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
Supplier	1	158.33	158.33	158.33	158.33	158.33	158.33	158.33	158.33	158.33	158.33	158.33	158.33	158.33	158.33
	2	4.29	4.29	4.29	4.29	4.29	4.29	4.29	4.29	4.29	4.29	4.29	4.29	4.29	4.29
	3	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14
	4	4.36	4.36	4.36	4.36	4.36	4.36	4.36	4.36	4.36	4.36	4.36	4.36	4.36	4.36
	5	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
	6	5.62	5.62	5.62	5.62	5.62	5.62	5.62	5.62	5.62	5.62	5.62	5.62	5.62	5.62
	7	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	8	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	9	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	10	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	11	189	189	189	189	189	189	189	189	189	189	189	189	189	189
	12	191.63	191.63	191.63	191.63	191.63	191.63	191.63	191.63	191.63	191.63	191.63	191.63	191.63	191.63
	13	35.67	35.67	35.67	35.67	35.67	35.67	35.67	35.67	35.67	35.67	35.67	35.67	35.67	35.67
	14	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	15	26	26	26	26	26	26	26	26	26	26	26	26	26	26
	16	340	340	340	340	340	340	340	340	340	340	340	340	340	340
	17	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	18	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
	19	2.67	2.67	2.67	2.67	2.67	2.67	2.67	2.67	2.67	2.67	2.67	2.67	2.67	2.67
	20	9	9	9	9	9	9	9	9	9	9	9	9	9	9
	21	47	47	47	47	47	47	47	47	47	47	47	47	47	47
	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22
	23	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	24	4	4	4	4	4	4	4	4	4	4	4	4	4	4
	25	24.04	24.04	24.04	24.04	24.04	24.04	24.04	24.04	24.04	24.04	24.04	24.04	24.04	24.04
	26	15	15	15	15	15	15	15	15	15	15	15	15	15	15
	27	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	28	102.67	102.67	102.67	102.67	102.67	102.67	102.67	102.67	102.67	102.67	102.67	102.67	102.67	102.67
	29	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
	30	371.25	371.25	371.25	371.25	371.25	371.25	371.25	371.25	371.25	371.25	371.25	371.25	371.25	371.25
	31	23.04	23.04	23.04	23.04	23.04	23.04	23.04	23.04	23.04	23.04	23.04	23.04	23.04	23.04
	32	98.06	98.06	98.06	98.06	98.06	98.06	98.06	98.06	98.06	98.06	98.06	98.06	98.06	98.06
	33	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	34	70	70	70	70	70	70	70	70	70	70	70	70	70	70
	35	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	36	4.57	4.57	4.57	4.57	4.57	4.57	4.57	4.57	4.57	4.57	4.57	4.57	4.57	4.57
	37	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45
	38	19.56	19.56	19.56	19.56	19.56	19.56	19.56	19.56	19.56	19.56	19.56	19.56	19.56	19.56
	39	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14
	40	39	39	39	39	39	39	39	39	39	39	39	39	39	39
	41	18.33	18.33	18.33	18.33	18.33	18.33	18.33	18.33	18.33	18.33	18.33	18.33	18.33	18.33
	42	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33
	43	2.88	2.88	2.88	2.88	2.88	2.88	2.88	2.88	2.88	2.88	2.88	2.88	2.88	2.88
	44	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	45	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
	46	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
	47	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	48	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	49	91.67	91.67	91.67	91.67	91.67	91.67	91.67	91.67	91.67	91.67	91.67	91.67	91.67	91.67

DEMAND		Period													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
Supplier	50	19.14	19.14	19.14	19.14	19.14	19.14	19.14	19.14	19.14	19.14	19.14	19.14	19.14	19.14
	51	22.69	22.69	22.69	22.69	22.69	22.69	22.69	22.69	22.69	22.69	22.69	22.69	22.69	22.69
	52	256.69	256.69	256.69	256.69	256.69	256.69	256.69	256.69	256.69	256.69	256.69	256.69	256.69	256.69
	53	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	54	56.67	56.67	56.67	56.67	56.67	56.67	56.67	56.67	56.67	56.67	56.67	56.67	56.67	56.67
	55	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	56	52.5	52.5	52.5	52.5	52.5	52.5	52.5	52.5	52.5	52.5	52.5	52.5	52.5	52.5
	57	38.79	38.79	38.79	38.79	38.79	38.79	38.79	38.79	38.79	38.79	38.79	38.79	38.79	38.79
	58	54	54	54	54	54	54	54	54	54	54	54	54	54	54
	59	3.33	3.33	3.33	3.33	3.33	3.33	3.33	3.33	3.33	3.33	3.33	3.33	3.33	3.33
	60	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44
	61	68.5	68.5	68.5	68.5	68.5	68.5	68.5	68.5	68.5	68.5	68.5	68.5	68.5	68.5
	62	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	63	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	64	10.65	10.65	10.65	10.65	10.65	10.65	10.65	10.65	10.65	10.65	10.65	10.65	10.65	10.65
	65	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74
	66	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	67	34.67	34.67	34.67	34.67	34.67	34.67	34.67	34.67	34.67	34.67	34.67	34.67	34.67	34.67
	68	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5
	69	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	70	10.21	10.21	10.21	10.21	10.21	10.21	10.21	10.21	10.21	10.21	10.21	10.21	10.21	10.21
	71	8.62	8.62	8.62	8.62	8.62	8.62	8.62	8.62	8.62	8.62	8.62	8.62	8.62	8.62
	72	13	13	13	13	13	13	13	13	13	13	13	13	13	13
	73	5.06	5.06	5.06	5.06	5.06	5.06	5.06	5.06	5.06	5.06	5.06	5.06	5.06	5.06
	74	373.33	373.33	373.33	373.33	373.33	373.33	373.33	373.33	373.33	373.33	373.33	373.33	373.33	373.33
	75	45.31	45.31	45.31	45.31	45.31	45.31	45.31	45.31	45.31	45.31	45.31	45.31	45.31	45.31
	76	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15
	77	11.67	11.67	11.67	11.67	11.67	11.67	11.67	11.67	11.67	11.67	11.67	11.67	11.67	11.67
	78	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	79	243	243	243	243	243	243	243	243	243	243	243	243	243	243
	80	15.38	15.38	15.38	15.38	15.38	15.38	15.38	15.38	15.38	15.38	15.38	15.38	15.38	15.38
	81	4.75	4.75	4.75	4.75	4.75	4.75	4.75	4.75	4.75	4.75	4.75	4.75	4.75	4.75
	82	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
	83	80	80	80	80	80	80	80	80	80	80	80	80	80	80
	84	120	120	120	120	120	120	120	120	120	120	120	120	120	120
	85	1.56	1.56	1.56	1.56	1.56	1.56	1.56	1.56	1.56	1.56	1.56	1.56	1.56	1.56
	86	393.33	393.33	393.33	393.33	393.33	393.33	393.33	393.33	393.33	393.33	393.33	393.33	393.33	393.33
	87	18.04	18.04	18.04	18.04	18.04	18.04	18.04	18.04	18.04	18.04	18.04	18.04	18.04	18.04
	88	55	55	55	55	55	55	55	55	55	55	55	55	55	55
	89	45.67	45.67	45.67	45.67	45.67	45.67	45.67	45.67	45.67	45.67	45.67	45.67	45.67	45.67
	90	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	91	17	17	17	17	17	17	17	17	17	17	17	17	17	17
	92	7.75	7.75	7.75	7.75	7.75	7.75	7.75	7.75	7.75	7.75	7.75	7.75	7.75	7.75
	93	82.28	82.28	82.28	82.28	82.28	82.28	82.28	82.28	82.28	82.28	82.28	82.28	82.28	82.28
	94	4.44	4.44	4.44	4.44	4.44	4.44	4.44	4.44	4.44	4.44	4.44	4.44	4.44	4.44
	95	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	96	62	62	62	62	62	62	62	62	62	62	62	62	62	62
	97	162.11	162.11	162.11	162.11	162.11	162.11	162.11	162.11	162.11	162.11	162.11	162.11	162.11	162.11
	98	35.24	35.24	35.24	35.24	35.24	35.24	35.24	35.24	35.24	35.24	35.24	35.24	35.24	35.24

Results for VNSIRP

S12T5

Total cost	distance	holding cost	vehicle	time
2232.3219	1753.32190	159	16	255.28004
2230.3971	1666.39714	264	15	170.60269
2210.2848	1722.28477	168	16	193.51924
2241.9437	1747.94373	174	16	208.51094
2116.6977	1575.69772	261	14	184.59598
2158.0171	1687.01707	171	15	186.6396
2303.4214	1776.42143	207	16	249.6328
2218.1477	1772.14770	126	16	184.81438
2278.4228	1636.42277	342	15	156.4846
2217.1713	1698.17130	219	15	191.36643

S12T10

Total cost	distance	holding cost	vehicle	time
4731.4991	3616.499087	435	34	408.78502
4558.5798	3444.579775	474	32	443.12084
4520.9145	3433.914474	447	32	486.95712
4543.4831	3628.483082	255	33	595.86142
4633.3724	3638.372397	315	34	512.21368
4400.4443	3411.444293	369	31	437.66081
4653.4819	3716.481889	237	35	446.05366
4614.1391	3570.139132	384	33	485.00711
4645.8282	3671.828155	294	34	452.4497
4723.6615	3798.661461	225	35	511.07488

S12T14

Total cost	distance	holding cost	vehicle	time
6472.2037	5080.20372	432	48	439.89162
6409.1661	4849.166055	660	45	485.61551
6513.0315	4994.031483	579	47	437.75441
6506.0769	5168.076932	378	48	427.94194
6746.602	5359.602049	387	50	370.87678
6576.5146	5142.514563	474	48	467.3946
6615.2557	5115.255664	540	48	422.80951
6301.0949	4903.094894	498	45	533.86662
6540.4273	5083.427274	537	46	504.83484
6503.7218	5146.721756	417	47	467.691

S20T5

Total cost	distance	holding cost	vehicle	time
3334.9616	2563.961608	291	24	1077.3741
3319.4131	2491.413107	348	24	1278.3034
3348.2502	2595.250231	273	24	1276.2286
3230.1274	2380.127411	390	23	1441.9484
3260.5864	2434.586406	366	23	1399.3446
3269.1234	2465.123409	324	24	1202.7677
3214.6636	2389.663606	345	24	1200.7709
3337.5964	2548.596417	309	24	1413.4003
3323.0703	2555.07029	288	24	1187.0272
3278.8205	2510.820511	288	24	1258.1325

S20T10

Total cost	distance	holding cost	vehicle	time
6843.5622	5174.562167	669	50	2554.9688
7021.6729	5524.672901	477	51	2557.9016
6894.2667	5300.266736	594	50	2516.2181
7012.7129	5518.712925	474	51	2571.4737
6820.501	5083.500968	777	48	2774.6026
6689.0021	5019.002108	690	49	2384.8809
6895.2886	5292.288575	603	50	2324.6021
7011.5076	5535.507635	456	51	2412.9455
6958.2167	5416.216671	522	51	2436.9072

S20T14

Total cost	distance	holding cost	vehicle	time
10008.706	7997.705612	531	74	6428.5204
9575.9817	7210.981663	1005	68	6901.063
10019.299	7956.298927	603	73	6456.9594
9808.5375	7659.537455	729	71	6196.0789
9856.0433	7596.04333	840	71	6608.0776
9947.7598	7826.759848	681	72	6498.9549
10199.456	8231.455741	468	75	6567.7981
9775.583	7573.583014	762	72	6039.9843
9743.2573	7537.257336	786	71	6323.7969
9961.1555	7835.155527	666	73	6371.268

S20T21

Total cost	distance	holding cost	vehicle	time
14800.786	11428.78557	1212	108	5479.2387
14734.078	11422.07788	1212	105	5847.5727
14718.846	11344.84616	1254	106	5793.3311
14778.739	11467.73904	1191	106	5727.4987
14498.324	10953.32362	1425	106	6029.8443
15191.414	12151.41421	840	110	5118.6112
14696.113	11426.11345	1110	108	5464.0754
14860.613	11761.61252	939	108	5234.1924
14854.888	11526.88833	1188	107	5578.1122
14812.276	11484.27557	1188	107	5339.0718

S50T5

Total cost	distance	holding cost	vehicle	time
5553.7442	4295.744214	298	48	12548.034
5593.468	4412.468018	241	47	17085.682
5580.1349	4365.134932	255	48	14838.909
5530.9539	4388.953939	182	48	15965.704
5508.3088	4329.308766	219	48	11423.142
5536.2957	4391.29565	205	47	15399.171
5617.6273	4437.627327	220	48	14977.999
5536.8066	4400.806569	176	48	13908.113
5663.3922	4489.392197	194	49	13853.575
5448.7989	4258.798879	270	46	15920.978

S50T10

Total cost	distance	holding cost	vehicle	time
12086.87	9657.869862	369	103	62701.81
11788.256	9371.255853	337	104	62628.271
11601.299	9112.299101	429	103	56720.06
11780.228	9269.228252	411	105	54461.65
11525.111	9014.111429	451	103	59205.578
11493.581	8908.581376	545	102	57054.651
11993.326	9549.325543	364	104	52861.5
11824.872	9278.871662	466	104	53460.966
11760.316	9356.315522	344	103	58665.705
11945.693	9495.692888	390	103	58626.892

S50T14

Total cost	distance	holding cost	vehicle	time
16958.561	13413.56129	625	146	81746.724
16790.447	13194.44721	656	147	74675.292
17152.02	13615.01996	537	150	71001.297
16699.207	13089.20708	650	148	70968.069
16823.707	13301.70705	562	148	73916.846
16971.496	13363.49556	668	147	77621.23
16958.008	13365.00813	653	147	73006.69
16893.524	13338.52415	595	148	73775.541
16823.707	13301.70705	562	148	73916.846
16971.496	13363.49556	668	147	77621.23

S50T21

Total cost	distance	holding cost	vehicle	time
26351.747	20922.74716	809	231	44050.096
26202.525	20792.52505	810	230	43466.091
25520.636	20015.63603	1005	225	47699.895
25708.529	20213.52853	995	225	48112.752
26040.615	20566.61467	894	229	44869.912
26031.566	20531.5664	920	229	47786.414
25640.946	20163.94632	1017	223	48345.677
25860.649	20465.64896	875	226	45993.541
26160.792	20782.79187	758	231	44179.951
26059.931	20691.93085	788	229	47404.663

S98T5

Total cost	distance	holding cost	vehicle	time
623737.895	12198.97069	789.36	65	4533.997
633062.863	12377.21686	1002.02	66	4512.189
615610.347	12013.47554	2136.57	64	4690.342
615910.851	12012.32782	2494.46	64	4742.820
614969.003	12001.76965	2080.52	64	4795.377
624072.701	12197.24782	1210.31	65	4560.315
623041.674	12187.49949	666.70	65	4594.666
623386.316	12189.91213	890.71	65	4705.084
623317.257	12183.50455	1142.03	65	4728.858
616828.820	11998.23720	4116.96	64	4974.419

S98T10

Total cost	distance	holding cost	vehicle	time
1247610.15	24378.23779	2698.26000	130	11077.46
1238643.49	24195.16491	3085.24000	129	11148.95
1247037.09	24385.30287	1771.95000	130	10519.9
1239306.64	24207.31052	3141.11000	129	10841.02
1247706.93	24379.19490	2747.18000	130	10532.35
1238463.35	24205.93111	2366.79000	129	9901.461
1247845.2	24378.93713	2898.34000	130	11266.13
1247441.62	24396.75681	1603.78000	130	10081.19
1238072.35	24184.95692	3024.50000	129	11125.74
1238125.4	24194.22364	2614.22000	129	11074.78

S98T14

Total cost	distance	holding cost	vehicle	time
1745896.7	34129.12458	3040.4700	182	25345.966
1746265.1	34134.40408	3144.8600	182	24878.883
1737358.2	33953.80804	3467.7500	181	24589.923
1746169.6	34130.68879	3235.1300	182	21683.921
1746359.3	34134.80938	3218.8500	182	25951.78
1746042.0	34151.24924	2079.5800	182	21262.297
1745541.8	34128.56198	2713.6700	182	26650.587
1737475.7	33954.21632	3564.8800	181	23092.844
1742927.0	34064.98214	3.48E+03	181	26039.500
1747903.4	34172.66899	2.87E+03	182	26595.284

Results for EVNS1

S12T5

Total cost	vehicle	holding cost	distance	time
2127.8917	15	117	1710.8917	60.68439
2111.5784	15	111	1700.5784	62.7904
2156.8405	15	174	1682.8405	57.39277
2076.0939	14	174	1622.0939	78.5153
2120.0569	15	81	1739.0569	82.55573
2193.7036	16	87	1786.7036	63.64841
2183.8637	16	72	1791.8637	71.04286
2156.4134	15	219	1637.4134	59.31158
2243.6366	15	189	1754.6366	74.19408
2143.6896	15	93	1750.6896	74.66208

S12T10

Total cost	vehicle	holding cost	distance	time
4436.154	30	462	3374.154	316.3856
4363.759	31	267	3476.759	266.7929
4521.883	32	258	3623.883	272.8926
4320.057	30	336	3384.057	295.9807
4280.829	30	312	3368.829	280.9578
4469.857	31	297	3552.857	258.9929
4455.293	30	480	3375.293	256.5436
4436.438	31	312	3504.438	280.9734
4477.681	32	225	3612.681	253.096
4399.178	31	303	3476.178	272.7054

S12T14

Total cost	vehicle	holding cost	distance	time
6315.79	45	360	5055.79	567.50
6193.80	43	444	4889.80	599.96
6323.14	46	366	5037.14	534.33
6276.86	43	561	4855.86	642.41
6203.42	44	438	4885.42	568.36
6321.49	44	492	4949.49	621.74
6111.22	44	381	4850.22	605.50
6137.11	43	528	4749.11	579.98
6116.87	44	384	4852.87	620.42
6195.00	43	474	4861.00	615.94

S20T5

Total cost	vehicle	holding cost	distance	time
3201.701	21	270	2511.701	425.9919
3267.868	23	204	2603.868	328.0389
3236.2	22	210	2586.2	395.8993
3243.197	23	186	2597.197	345.0586
3266.992	22	228	2598.992	431.8108
3316.002	22	225	2651.002	396.4921
3208.776	22	183	2585.776	395.4469
3251.066	22	201	2610.066	450.9833
3279.289	23	168	2651.289	369.4884
3302.421	23	138	2704.421	372.8736

S20T10

Total cost	vehicle	holding cost	distance	time
6665.785	46	630	5115.785	1327.709
6756.676	47	333	5483.676	1355.305
6871.607	46	681	5270.607	1402.745
6591.033	45	450	5241.033	1494.926
6657.439	46	450	5287.439	1442.869
6745.917	47	309	5496.917	1494.942
6713.736	46	498	5295.736	1421.278
6887.603	48	336	5591.603	1263.639
6779.21	46	525	5334.21	1340.361
6676.213	46	567	5189.213	1400.671

S20T14

Total cost	vehicle	holding cost	distance	time
9465.856	65	789	7376.856	3012.083
9374.05	65	636	7438.05	2752.216
9534.046	66	432	7782.046	2933.63
9457.298	66	570	7567.298	2706.571
9448.192	66	696	7432.192	2777.691
9289.889	64	849	7160.889	2778.534
9478.139	65	816	7362.139	2884.911
9336.255	64	819	7237.255	2881.947
9360.872	65	636	7424.872	2922.507
9366.566	66	900	7146.566	2646.978

S20T21

Total cost	vehicle	holding cost	distance	time
14535.1	99	807	11748.1	4320.9
14353.41	100	855	11498.41	4584.745
14294.96	99	1023	11291.96	4621.452
14568.18	98	981	11627.18	4417.59
14338.4	97	762	11636.4	4626.49
14464.48	100	675	11789.48	4441.738
14494.13	101	933	11541.13	4528.584
14416.74	100	1452	10964.74	4917.152
14345.01	98	993	11392.01	4646.053
14228.16	97	996	11292.16	4737.984

S50T5

Total cost	vehicle	holding cost	distance	time
5587.978	48	164	4463.978	2302.091
5502.086	47	230	4332.086	2586.918
5542.425	48	187	4395.425	2538.105
5493.161	46	209	4364.161	2508.371
5530.392	48	154	4416.392	2113.923
5549.076	48	177	4412.076	2394.459
5545.273	48	225	4360.273	2390.45
5648.892	47	209	4499.892	2477.218
5626.652	48	104	4562.652	2275.93
5390.357	47	185	4265.357	2352.713

S50T10

Total cost	vehicle	holding cost	distance	time
11659.97	100	406	9253.972	4847.934
11645.21	102	354	9251.21	4711.074
11767.16	102	217	9510.156	4513.827
11773.05	103	342	9371.052	4706.129
11719.49	102	299	9380.488	4674.726
11720.81	102	246	9434.806	4530.082
11413.51	101	439	8954.509	5189.888
11644.89	101	321	9303.888	4844.954
11770.39	102	376	9354.386	4696.956
11416.16	100	474	8942.156	5361.52

S50T14

Total cost	vehicle	holding cost	distance	time
16466.34	145	529	13037.34	7266.995
16476.82	144	619	12977.82	7519.404
16537.85	144	574	13083.85	6888.599
16541.62	144	579	13082.62	6739.914
16394.92	143	667	12867.92	7877.052
16529.08	142	557	13132.08	7502.728
16503.07	144	569	13054.07	6871.984
16344.87	142	649	12855.87	7589.776
16547.13	145	487	13160.13	6627.936
16559.63	144	495	13184.63	6575.161

S50T21

Total cost	vehicle	holding cost	distance	time
25442.402	223	761	20221.4	14379.97
25297.665	223	763	20074.67	14372.53
25496.849	222	878	20178.85	14593.53
25552.165	226	676	20356.17	14587.65
25248.457	223	874	19914.46	17230.25
25442.514	222	979	20023.51	16254.29
25400.365	224	742	20178.36	15833.87
25278.012	223	762	20056.01	14488.48
25202.282	223	798	19944.28	15544.24
25565.691	222	635	20490.69	12437.05

S98T5

Total cost	vehicle	holding cost	distance	time
614932.8	64	1896.680	12004.72	5463.779
614801.9	64	1486.530	12010.31	5391.426
614708.1	64	1619.740	12005.77	6002.31
606088.4	63	2236.950	11825.03	5410.661
614727.4	64	1611.800	12006.31	5552.918
614472.6	64	1638.360	12000.68	5924.528
632739.9	66	753.790	12375.72	5483.685
605655.2	63	2460.480	11811.89	5769.12
614492.5	64	1582.440	12002.2	5673.507
614262.1	64	1352.820	12002.19	5735.314

S98T10

Total cost	vehicle	holding cost	distance	time
1246521	130	2338.940	24363.64	18915.09
1228745	128	2644.390	24010.01	17698.67
1247982	130	3154.300	24376.55	17690.97
1237502	129	2140.030	24191.24	18465.39
1246513	130	2293.500	24364.4	20837.79
1238076	129	3185.490	24181.82	20644.22
1211830	126	4475.700	23643.09	18739.01
1229068	128	3550.570	23998.35	21416.57
1237774	129	2242.210	24194.63	19395.39
1237807	129	2358.030	24192.97	17938.04

S98T14

Total cost	vehicle	holding cost	distance	time
1745310.0	182	3085.210	34116.5	44510.08
1718749.5	179	5018.160	33558.63	48079.18
1736250.4	181	2964.910	33941.71	45287.36
1728592.8	180	4408.340	33763.69	44790.79
1736152.7	181	3295.350	33933.15	47055.8
1736851.0	181	3479.970	33943.42	45757.6
1746381.3	182	3594.370	34127.74	41682.39
1736238.4	181	3211.130	33936.55	46086.85
1736464.1	181	3478.320	33935.71	44467.15
1744929.9	182	2891.560	34112.77	48646.56

Results for EVNS2

S12T5

Total cost	vehicle	holding cost	distance	time
2158.287	15	183	1675.287	60.77799
2141.595	15	102	1739.595	68.62484
2190.01	16	99	1771.01	53.85155
2160.919	15	138	1722.919	71.52646
2183.624	15	156	1727.624	59.43638
2101.048	15	111	1690.048	66.47203
2164.056	15	201	1663.056	72.66527
2166.299	15	147	1719.299	63.27401
2162.016	15	195	1667.016	68.79644
2110.066	14	186	1644.066	69.90405
2145.129	15	117	1728.129	59.35838

S12T10

Total cost	vehicle	holding cost	distance	time
4349.239	31	330	3399.239	194.2369
4361.943	31	387	3354.943	208.9789
4438.202	31	318	3500.202	197.3725
4454.017	31	258	3576.017	225.125
4502.837	32	291	3571.837	212.7386
4474.657	32	180	3654.657	202.8169
4443.687	31	393	3430.687	209.0569
4391.74	31	276	3495.74	204.0649
4454.616	31	387	3447.616	228.7911
4493.047	32	189	3664.047	211.2254

S12T14

Total cost	vehicle	holding cost	distance	time
6244.42	45	468	4876.421	596.5166
6228.95	44	432	4916.952	597.671
6266.20	44	552	4834.198	616.2976
6259.48	45	489	4870.485	527.2678
6269.57	46	282	5067.573	540.2783
6302.18	45	495	4907.181	578.8105
6216.60	45	327	4989.601	610.8843
6316.92	45	477	4939.92	606.9843
6366.53	45	492	4974.53	600.9003
6264.93	47	291	5033.934	503.618

S20T5

Total cost	vehicle	holding cost	distance	time
3360.073	23	216	2684.073	393.2629
3233.716	22	183	2610.716	403.6994
3276.289	22	174	2662.289	398.567
3299.908	23	243	2596.908	352.6247
3271.37	22	150	2681.37	392.1865
3267.115	22	222	2605.115	391.5937
3233.741	22	252	2541.741	393.1849
3290.09	22	129	2721.09	375.432
3209.261	22	234	2535.261	406.367
3226.373	22	129	2657.373	388.4893

S20T10

Total cost	vehicle	holding cost	distance	time
6627.951	46	495	5212.951	1319.612
6653.184	46	402	5331.184	1455.365
6701.018	46	426	5355.018	1407.035
6699.448	46	366	5413.448	1424.305
6725.443	47	582	5203.443	1332.826
6726.924	46	465	5341.924	1427.097
6743.202	46	417	5406.202	1369.455
6691.098	46	456	5315.098	1410.155
6853.023	45	564	5389.023	1534.395
6641.786	45	477	5264.786	1538.981

S20T14

Total cost	vehicle	holding cost	distance	time
9497.802	67	675	7482.802	2932.866
9482.682	66	657	7505.682	3055.342
9501.001	66	561	7620.001	3067.214
9609.389	67	615	7654.389	2827.3
9590.718	65	840	7450.718	2960.353
9458.810	66	597	7541.81	2841.636
9546.883	66	699	7527.883	2864.444
9386.829	65	717	7369.829	3074.78
9447.047	66	735	7392.047	2755.648
9658.624	68	525	7773.624	2674.31

S20T21

Total cost	vehicle	holding cost	distance	time
14339.64	98	1275	11104.64	5162.494
14215.68	99	996	11239.68	4916.559
14378.07	99	801	11597.07	4582.919
14586.2	100	939	11647.2	4683.618
14333.92	99	1017	11336.92	4819.074
14377.1	100	1128	11249.1	4777.406
14484.24	101	777	11687.24	4470.255
14439.4	100	1032	11407.4	5013.17
14387.65	101	1014	11353.65	4913.501
14419.46	100	990	11429.46	4838.995

S50T5

Total cost	vehicle	holding cost	distance	time
5601.101	48	139	4502.101	2730.751
5464.526	47	241	4283.526	2226.883
5508.767	47	208	4360.767	2365.24
5514.282	48	153	4401.282	2454.613
5545.345	47	129	4476.345	2582.862
5511.509	47	218	4353.509	2363.883
5469.823	47	224	4305.823	2615.279
5547.341	47	183	4424.341	2345.428
5466.795	46	160	4386.795	2094.033
5543.226	47	215	4388.226	2464.675

S50T10

Total cost	vehicle	holding cost	distance	time
11745.11	102	429	9276.112	4024.951
12046.94	103	200	9786.938	3870.432
11700.15	101	370	9310.149	4258.749
11724.46	101	395	9309.461	4244.647
11817.36	104	390	9347.357	3853.74
11879.09	103	378	9441.086	4239.093
11699.09	101	278	9401.092	4136.476
11755.48	102	349	9366.484	4067.632
11803.25	102	244	9519.253	4083.326
12045.85	103	297	9688.847	3931.522

S50T14

Total cost	vehicle	holding cost	distance	time
16682.22	143	670	13152.22	7674.547
16599.12	144	626	13093.12	6978.315
16559.45	144	588	13091.45	7120.541
16467.00	144	527	13060	7649.415
16814.46	145	382	13532.46	6144.162
16503.53	143	538	13105.53	7053.258
16808.10	145	451	13457.1	6336.293
16645.82	144	567	13198.82	7127.062
16710.97	143	452	13398.97	6103.851
16772.11	145	416	13456.11	6962.683

S50T21

Total cost	vehicle	holding cost	distance	time
25415.48	221	927	20068.48	15392.54
25425.98	221	899	20106.98	14916.77
26183.83	223	605	21118.83	11558.5
25617.24	225	826	20291.24	15276.16
25524.41	223	777	20287.41	12241.9
25839.52	228	753	20526.52	12502.17
25697.84	223	686	20551.84	11365
25612.59	224	805	20327.59	11292.69
25549.68	224	692	20377.68	12258.82
25457.17	224	710	20267.17	11613.04

S98T5

Total cost	vehicle	holding cost	distance	time
624025.2	65	1361.750	12193.27	6572.463
632887.7	66	1089.120	12371.97	6736.066
624638.0	65	1607.520	12200.61	6674.726
633063.2	66	748.400	12382.3	6493.765
633339.2	66	874.390	12385.3	6505.122
633097.5	66	958.120	12378.79	6605.586
624368.2	65	1600.100	12195.36	6678.766
624314.5	65	1397.230	12198.35	6539.801
624120.3	65	1097.910	12200.45	7252.525
623726.7	65	967.420	12195.19	6630.078

S98T10

Total cost	vehicle	holding cost	distance	time
1247845	130	2898.340	24378.94	11266.13
1247442	130	1603.780	24396.76	10081.19
1238072	129	3024.500	24184.96	11125.74
1238125	129	2614.220	24194.22	11074.78
1230214	128	3050.330	24031.27	9611.003
1247249	130	1794.390	24389.09	10291.87
1248455	130	2992.840	24389.25	9854.458
1238196	129	2653.390	24194.86	11056.57
1246960	130	1515.160	24388.9	9402.04
1247775	130	1705.300	24401.39	8808.596

S98T14

Total cost	vehicle	holding cost	distance	time
1728678.6	180	4115.010	33771.27	51529.72
1754784.0	183	2969.630	34304.29	47174.89
1746679.7	182	3963.900	34126.32	52550.74
1736164.6	181	3444.850	33930.4	49125.54
1746406.8	182	2660.170	34146.93	54340.95
1737489.4	181	3521.610	33955.36	44762.93
1737939.2	181	3946.570	33955.85	43315.96
1746003.4	182	2566.980	34140.73	42209.97
1756195.5	183	1959.290	34352.72	48084.06
1737917.7	181	3815.240	33958.05	51415.96

APPENDIX C

MATLAB CODES

Matlab Codes are in CD (Compact Disc) Form.