

## Appendix A: Proofs

### A.1. Proof of Proposition 1

We first prove property (i). Since  $Z_{c'}(\tilde{s}_{c'}) < x_{v_{c'}^m}$ , we have one of two cases. In the first case,  $Z_{c'}(\tilde{s}_{c'}) = 0$ , implying by equation (5) that  $A_{v_{c'}^m} + t(v_{c'}^m, 0) > L$ . By the triangle inequality, this implies that for any  $A_{v_{c'+1}^m}$  that may result from equations (3) or (4),  $A_{v_{c'+1}^m} + t(v_{c'+1}^m, 0) > L$ . Thus,  $Z_{c'+1}(\tilde{s}_{c'+1}) = 0$ . The same argument applies for  $c = c' + 2, \dots, C^m$ . In the second case,  $0 < Z_{c'}(\tilde{s}_{c'}) < x_{v_{c'}^m}$ , implying by equation (5) that  $\lfloor (L - t(v_{c'}^m, 0) - A_{v_{c'}^m}) / (t(v_{c'}^m, 0) + t(0, v_{c'}^m)) \rfloor < \lfloor (x_{v_{c'}^m} - Q_{v_{c'}^m}) / Q \rfloor$ , meaning the number of replenishments required to satisfy demand in full is greater than the number of replenishments possible before violating the route duration limit  $L$ . Let  $t'$  be the time at which demand at customer  $v_{c'}^m$  is served in full. It must be that  $t' + t(v_{c'}^m, 0) > L$ . Then, by the triangle inequality,  $t' + t(v_{c'}^m, v_{c'+1}^m) + t(v_{c'+1}^m, 0) > L$  and  $t' + t(v_{c'}^m, 0) + t(0, v_{c'+1}^m) + t(v_{c'+1}^m, 0) > L$ , meaning that  $A_{v_{c'+1}^m} + t(v_{c'+1}^m, 0) > L$  regardless of the action selected at decision epoch  $c'$ . Thus,  $Z_{c'+1}(\tilde{s}_{c'+1}) = 0$ . Then, using the arguments presented for the first case,  $Z_c(\tilde{s}_c) = 0$  for  $c = c' + 2, \dots, C^m$ .

We prove property (ii) by contradiction. Suppose there exists some  $c \in \{1, 2, \dots, c' - 1\}$  such that  $Z_c(\tilde{s}_c) < x_{v_c^m}$ . Then, by property (i),  $Z_j(\tilde{s}_j) = 0$  for  $j = c + 1, c + 2, \dots, C^m$ . Yet, by assumption,  $Z_j(\tilde{s}_j) = x_{v_j^m}$  for  $j = 1, 2, \dots, c' - 1$ .

### A.2. Proof of Proposition 2

The proof is by induction. First, note that if  $\tilde{V}_{C^m}(\tilde{s}_{C^m}; v^m, x) < x_{v_{C^m}^m}$ , then  $\tilde{V}_c(\tilde{s}_{C^m}; v^m, x)$  increases as  $Q_{v_{C^m}^m}$  increases and as  $A_{v_{C^m}^m}$  decreases. If  $\tilde{V}_{C^m}(\tilde{s}_{C^m}; v^m, x) = x_{v_{C^m}^m}$ , then  $\tilde{V}_{C^m}(\tilde{s}_{C^m})$  is constant as it is bounded above by  $x_{v_{C^m}^m}$ . Thus, the result holds for stage  $C^m$ . Assume the result holds for stages  $C^m - 1, C^m - 2, \dots, c + 1$ . At stage  $c$ , it follows from equation (??) that  $Z_c(\tilde{s}_c)$  increases as  $Q_{v_c^m}$  increases and as  $A_{v_c^m}$  decreases. As in stage  $C^m$ ,  $Z_c(\tilde{s}_c)$  is constant if  $Z_c(\tilde{s}_c) = x_{v_c^m}$ . By the induction hypothesis, the reward-to-go,  $\tilde{V}_{c+1}(\tilde{s}_{c+1}; v^m, x)$ , also increases as  $Q_{v_c^m}$  increases and as  $A_{v_c^m}$  decreases. Because the value function at stage  $c$  is the sum of two functions that increase as  $Q_{v_c^m}$  increases and as  $A_{v_c^m}$  decreases, the result holds at stage  $c$ .

## Appendix B: Disaggregated Results of Computational Results

In this appendix, we report the disaggregated results of our computational experiments. Table 10 details problem instance parameters. Table 11 displays the expected demand served by the benchmark restocking fixed-route policies. Table 12 shows the expected demand for each problem instance; expected demand does not change with variability in customer demand. Tables 13, 14, and 15 depict disaggregated results for our rollout policies without decomposition. Tables 16, 17, and 18 present disaggregated results for our rollout policies with static decomposition. Tables 19, 20, and 21 display disaggregated results for our rollout policies with dynamic decomposition. Table 22 is similar to Table ??, except Table 22 displays the average number of CPU seconds required to execute each method for an entire instance; Table ?? only presents the average number of CPU seconds per decision epoch. Tables 23-37 display disaggregate results for our second set of computational experiments with various heuristic mechanisms and initial policies. In Table 11, Tables 13-21, and Tables 23-37, each entry is the average demand served by the respective method across 500 realizations of the problem instance. The values in Table 12 are exact calculations.



**Table 13 Average Demand Served by One-Step Rollout without Decomposition.**

Duration Capacity	short			medium			long		
	small	medium	large	small	medium	large	small	medium	large
<b>Low Variability</b>									
R101 (25)	156.26	221.97	278.66	238.59	324.85	332.00	313.31	331.97	331.68
C101 (25)	223.95	299.10	320.06	317.41	455.14	459.41	391.97	459.38	459.63
<b>Moderate Variability</b>									
R101 (25)	150.00	217.63	273.27	228.73	315.50	331.00	297.36	331.36	331.51
C101 (25)	217.11	293.65	319.50	308.03	434.09	458.03	383.97	456.92	458.96
<b>High Variability</b>									
R101 (25)	144.78	209.63	262.09	216.37	298.84	329.59	282.83	331.35	331.56
C101 (25)	206.19	281.06	312.30	299.57	406.90	454.30	374.02	453.56	459.47

**Table 14 Average Demand Served by Post-Decision Rollout without Decomposition.**

Duration Capacity	short			medium			long		
	small	medium	large	small	medium	large	small	medium	large
<b>Low Variability</b>									
R101 (25)	156.15	221.98	278.66	238.43	326.13	331.96	313.25	331.99	331.99
C101 (25)	223.95	298.81	320.06	317.55	455.22	459.53	391.99	459.16	459.51
<b>Moderate Variability</b>									
R101 (25)	150.05	217.25	273.25	228.64	315.76	331.25	297.70	331.46	331.44
C101 (25)	217.42	293.51	319.60	309.09	434.16	457.82	383.98	456.40	459.03
<b>High Variability</b>									
R101 (25)	144.24	209.61	262.10	216.28	298.55	329.57	282.73	331.26	331.60
C101 (25)	204.12	280.42	313.28	298.80	406.95	453.89	372.92	453.72	459.44

**Table 15 Average Demand Served by Pre-Decision Rollout without Decomposition.**

Duration Capacity	short			medium			long		
	small	medium	large	small	medium	large	small	medium	large
<b>Low Variability</b>									
R101 (25)	156.26	221.93	278.66	237.90	325.84	332.01	311.81	332.02	332.04
C101 (25)	223.96	299.12	320.02	317.33	455.06	459.64	391.46	459.20	459.64
R101 (50)	360.36	501.27	633.27	523.93	716.84	721.05	665.88	721.12	721.15
C101 (50)	339.03	541.44	606.72	545.14	801.94	859.51	679.49	859.30	859.90
R101 (75)	595.10	833.97	1011.36	841.58	1077.78	1078.36	1038.53	1078.33	1078.40
C101 (75)	760.68	1099.12	1296.29	1073.93	1359.58	1359.95	1302.97	1360.04	1360.05
R101 (100)	809.01	1147.16	1378.49	1151.03	1457.79	1458.51	1394.95	1458.51	1458.60
C101 (100)	923.41	1351.02	1653.20	1307.92	1803.54	1810.80	1641.42	1810.73	1810.84
<b>Moderate Variability</b>									
R101 (25)	149.56	217.19	273.16	226.34	314.28	331.14	295.52	331.55	331.61
C101 (25)	216.41	293.81	319.37	306.84	432.93	457.81	379.98	457.14	459.23
R101 (50)	334.09	488.27	611.12	502.21	695.38	720.29	636.21	720.39	720.48
C101 (50)	325.95	511.14	582.92	526.61	769.22	849.40	661.69	854.21	858.51
R101 (75)	566.23	794.36	966.11	808.58	1067.28	1077.22	997.48	1076.89	1077.49
C101 (75)	733.76	1057.77	1263.94	1040.89	1343.56	1357.70	1262.63	1360.01	1359.30
R101 (100)	772.73	1104.63	1329.75	1104.23	1443.13	1457.21	1348.52	1457.17	1457.35
C101 (100)	874.44	1306.45	1602.74	1275.16	1772.34	1808.53	1588.98	1809.20	1809.90
<b>High Variability</b>									
R101 (25)	142.26	204.10	262.11	215.13	297.57	329.66	280.96	331.29	331.70
C101 (25)	197.18	280.90	310.75	293.78	402.11	454.25	369.23	453.41	459.42
R101 (50)	318.30	465.63	577.69	482.19	662.14	715.88	611.38	715.40	716.93
C101 (50)	314.26	481.58	567.60	497.25	714.24	823.78	637.02	838.74	854.95
R101 (75)	527.42	760.55	912.62	775.51	1043.07	1075.38	967.65	1075.26	1075.63
C101 (75)	698.65	1014.63	1194.86	1004.76	1323.92	1359.87	1219.95	1358.94	1360.58
R101 (100)	726.77	1043.24	1255.35	1055.71	1410.60	1452.19	1308.35	1452.35	1452.86
C101 (100)	823.89	1240.74	1519.21	1228.86	1690.16	1800.91	1540.75	1803.63	1806.43

**Table 16 Average Demand Served by One-Step Rollout with Static Decomposition.**

Duration Capacity	short			medium			long		
	small	medium	large	small	medium	large	small	medium	large
<b>Low Variability</b>									
R101 (25)	156.15	221.92	278.66	237.48	324.61	332.02	312.44	332.00	332.04
C101 (25)	223.21	299.03	320.02	317.15	454.97	459.62	391.12	459.16	458.63
R101 (50)	361.06	501.20	632.47	524.79	716.61	720.82	665.96	720.61	721.12
C101 (50)	337.89	541.34	606.40	544.09	801.50	859.40	677.36	858.79	859.79
R101 (75)	595.27	833.98	1010.95	841.91	1077.74	1078.25	1038.58	1078.05	1078.32
C101 (75)	759.02	1099.32	1293.81	1069.68	1359.04	1359.75	1300.23	1359.84	1359.39
R101 (100)	808.56	1146.77	1376.57	1151.22	1457.41	1458.44	1390.46	1457.07	1457.70
C101 (100)	921.66	1351.45	1648.26	1305.83	1802.51	1810.70	1633.05	1808.60	1810.75
<b>Moderate Variability</b>									
R101 (25)	149.14	216.45	273.03	225.74	313.84	331.36	291.35	331.38	331.57
C101 (25)	213.35	293.13	319.30	301.30	428.45	457.56	372.77	455.80	458.79
R101 (50)	330.76	487.71	610.45	497.77	692.82	719.85	627.05	719.11	720.21
C101 (50)	322.62	506.19	581.84	512.61	765.82	846.61	650.12	850.88	858.04
R101 (75)	559.28	793.63	964.07	796.98	1056.98	1076.67	979.45	1075.99	1077.09
C101 (75)	717.12	1050.76	1255.85	1018.50	1333.84	1357.71	1230.97	1358.42	1359.18
R101 (100)	762.49	1101.67	1327.59	1083.46	1436.94	1454.81	1322.92	1455.44	1456.10
C101 (100)	848.78	1296.81	1585.45	1236.61	1749.06	1806.95	1542.51	1806.46	1808.22
<b>High Variability</b>									
R101 (25)	141.72	202.59	261.95	211.48	295.84	329.49	273.91	330.99	331.70
C101 (25)	184.92	273.26	306.92	282.41	396.96	449.91	350.63	447.88	458.88
R101 (50)	311.61	460.42	573.24	467.87	652.49	713.76	587.35	713.44	716.50
C101 (50)	303.60	474.69	559.41	472.80	695.75	818.90	605.78	820.74	854.02
R101 (75)	511.15	755.01	902.86	750.05	1025.99	1074.12	927.64	1073.57	1075.21
C101 (75)	659.67	980.17	1177.51	952.99	1292.50	1357.29	1147.05	1356.11	1359.84
R101 (100)	703.45	1024.66	1245.35	1013.06	1381.31	1449.82	1242.80	1449.52	1451.27
C101 (100)	782.55	1212.71	1482.56	1155.57	1637.88	1794.12	1445.07	1789.60	1805.35

**Table 17 Average Demand Served by Post-Decision Rollout with Static Decomposition.**

Duration Capacity	short			medium			long		
	small	medium	large	small	medium	large	small	medium	large
<b>Low Variability</b>									
R101 (25)	156.15	221.93	278.66	237.48	325.70	332.02	312.44	331.94	332.04
C101 (25)	223.21	299.03	320.02	317.15	454.98	459.58	391.12	459.12	458.57
R101 (50)	361.06	501.20	632.47	524.79	716.61	720.82	665.96	720.99	720.62
C101 (50)	337.89	541.34	606.40	544.09	801.38	859.50	677.37	859.02	859.76
R101 (75)	595.27	833.98	1010.95	842.56	1077.66	1078.29	1038.79	1078.15	1078.27
C101 (75)	759.02	1099.32	1293.78	1069.94	1359.09	1359.98	1300.37	1358.44	1360.03
R101 (100)	808.56	1146.77	1376.60	1151.18	1457.37	1458.16	1390.30	1457.50	1458.49
C101 (100)	921.66	1351.45	1648.07	1305.73	1802.29	1810.66	1633.37	1808.98	1810.75
<b>Moderate Variability</b>									
R101 (25)	149.14	216.46	273.03	225.74	313.84	331.36	291.35	331.29	331.61
C101 (25)	213.35	293.13	319.30	301.99	428.41	457.56	372.73	456.17	458.83
R101 (50)	330.80	487.55	610.44	498.23	692.82	720.00	627.06	719.60	720.09
C101 (50)	322.62	506.20	581.84	512.55	766.04	846.51	650.26	851.05	858.06
R101 (75)	559.30	793.62	963.81	797.00	1060.46	1076.91	979.57	1075.92	1077.17
C101 (75)	716.97	1050.79	1256.26	1018.58	1334.31	1357.44	1231.02	1358.52	1358.87
R101 (100)	762.46	1101.73	1327.62	1083.40	1437.01	1454.85	1322.90	1456.24	1456.87
C101 (100)	848.76	1297.51	1585.52	1236.66	1749.13	1806.78	1543.16	1805.93	1808.94
<b>High Variability</b>									
R101 (25)	141.61	202.59	261.95	211.53	295.83	329.48	274.35	330.83	331.65
C101 (25)	184.92	273.26	306.66	282.58	396.98	449.91	350.04	447.94	458.71
R101 (50)	311.61	460.05	573.25	468.02	652.28	713.81	587.48	713.93	716.66
C101 (50)	303.61	474.69	559.41	473.06	695.80	818.85	605.93	821.91	854.47
R101 (75)	511.88	755.04	902.75	750.08	1026.37	1073.19	927.87	1074.06	1075.40
C101 (75)	660.28	980.08	1177.96	952.96	1292.65	1357.15	1147.23	1355.91	1359.87
R101 (100)	703.36	1024.52	1245.39	1013.38	1381.14	1450.04	1242.27	1449.50	1452.09
C101 (100)	782.91	1213.56	1482.57	1155.47	1638.17	1794.57	1445.17	1789.79	1805.59

**Table 18 Average Demand Served by Pre-Decision Rollout with Static Decomposition.**

Duration Capacity	short			medium			long		
	small	medium	large	small	medium	large	small	medium	large
<b>Low Variability</b>									
R101 (25)	156.15	221.93	278.66	236.90	325.38	332.01	308.01	331.98	332.04
C101 (25)	222.21	298.74	320.02	317.07	454.56	459.44	391.09	459.16	459.64
R101 (50)	354.92	501.20	632.47	520.38	716.59	721.04	661.69	720.78	721.15
C101 (50)	336.73	541.30	606.40	543.51	801.22	859.28	676.47	858.92	859.87
R101 (75)	593.76	831.77	1010.24	837.70	1077.39	1078.20	1034.26	1076.78	1078.23
C101 (75)	756.57	1097.16	1294.36	1067.83	1357.99	1359.55	1299.86	1359.45	1360.05
R101 (100)	803.42	1146.33	1376.46	1140.98	1456.67	1458.09	1383.69	1455.94	1458.47
C101 (100)	918.79	1349.53	1648.26	1304.85	1801.67	1810.42	1629.44	1808.90	1810.35
<b>Moderate Variability</b>									
R101 (25)	147.51	215.87	273.03	223.22	312.90	330.76	287.98	331.09	331.61
C101 (25)	207.58	292.59	319.06	300.68	425.49	457.50	372.25	455.67	459.01
R101 (50)	329.95	486.24	610.00	494.30	690.85	719.14	619.45	718.78	720.22
C101 (50)	322.04	505.71	581.77	507.68	764.40	846.26	644.36	850.36	856.92
R101 (75)	558.08	791.92	962.29	793.13	1059.74	1075.92	975.12	1074.56	1076.54
C101 (75)	711.85	1046.57	1252.74	1015.24	1334.17	1356.72	1228.61	1357.86	1359.02
R101 (100)	755.10	1094.05	1326.28	1078.36	1435.19	1455.73	1313.87	1454.19	1455.65
C101 (100)	842.98	1292.65	1580.31	1228.41	1748.60	1805.63	1539.07	1804.63	1808.80
<b>High Variability</b>									
R101 (25)	140.81	202.59	261.95	208.50	291.96	328.16	270.53	328.45	331.53
C101 (25)	184.90	272.76	306.58	280.31	395.29	448.86	347.76	447.75	458.80
R101 (50)	309.47	458.77	571.84	461.48	651.86	712.95	581.60	712.59	716.59
C101 (50)	303.09	474.69	559.07	469.85	694.75	818.23	602.67	820.53	854.34
R101 (75)	508.81	752.50	902.11	747.06	1024.07	1070.85	923.77	1070.62	1075.17
C101 (75)	656.07	978.99	1178.08	951.21	1290.25	1355.54	1144.80	1355.09	1359.74
R101 (100)	697.32	1020.06	1240.32	1006.87	1379.15	1449.18	1235.95	1447.70	1450.07
C101 (100)	778.98	1207.66	1481.80	1149.89	1634.19	1792.21	1439.30	1786.81	1803.95

**Table 19 Average Demand Served by One-Step Rollout with Dynamic Decomposition.**

Duration Capacity	short			medium			long		
	small	medium	large	small	medium	large	small	medium	large
<b>Low Variability</b>									
R101 (25)	156.26	221.93	278.66	237.91	324.65	332.00	312.06	332.01	332.04
C101 (25)	223.96	299.13	320.02	317.34	455.06	459.39	391.48	459.22	459.64
R101 (50)	360.62	501.27	633.27	524.58	717.17	720.82	665.42	720.64	721.09
C101 (50)	338.90	541.54	606.70	545.29	802.21	859.47	679.27	859.24	859.88
R101 (75)	595.93	833.95	1011.37	842.86	1077.53	1078.36	1038.96	1078.29	1078.41
C101 (75)	760.24	1099.10	1296.55	1073.61	1358.71	1359.95	1302.98	1360.04	1359.87
R101 (100)	809.26	1146.99	1378.23	1152.07	1457.97	1458.49	1395.44	1458.42	1458.47
C101 (100)	924.38	1351.11	1652.68	1308.30	1802.98	1810.80	1641.20	1809.85	1810.84
<b>Moderate Variability</b>									
R101 (25)	149.49	217.08	273.16	226.86	314.36	331.17	295.05	331.52	331.57
C101 (25)	215.94	293.74	319.37	306.74	433.03	457.86	380.40	457.17	459.14
R101 (50)	334.04	488.17	611.01	502.73	695.75	720.12	637.41	720.33	720.45
C101 (50)	326.30	510.72	583.03	526.61	769.64	849.31	662.60	854.34	858.48
R101 (75)	566.63	794.68	966.15	808.57	1066.94	1077.20	998.59	1076.89	1077.51
C101 (75)	733.12	1057.90	1262.07	1041.38	1343.45	1358.43	1262.33	1359.95	1359.28
R101 (100)	773.95	1104.09	1329.71	1104.91	1443.21	1457.12	1350.17	1456.78	1457.26
C101 (100)	874.35	1307.04	1604.17	1276.08	1771.71	1808.70	1588.60	1809.21	1809.32
<b>High Variability</b>									
R101 (25)	142.77	204.63	262.10	215.22	297.58	329.67	280.81	331.21	331.71
C101 (25)	197.51	279.81	310.26	294.43	402.09	454.42	370.05	453.42	459.13
R101 (50)	318.58	465.76	577.74	481.49	661.06	715.64	611.88	715.34	716.78
C101 (50)	314.75	480.92	566.90	497.17	714.13	823.67	636.53	838.27	854.87
R101 (75)	527.53	760.43	913.53	776.31	1043.61	1075.30	967.97	1075.28	1075.60
C101 (75)	698.54	1013.12	1196.75	1005.66	1323.96	1359.76	1220.91	1358.80	1360.57
R101 (100)	728.58	1043.41	1261.03	1053.92	1410.86	1451.80	1309.60	1452.25	1452.65
C101 (100)	822.45	1239.57	1520.27	1227.91	1688.28	1800.60	1540.32	1803.11	1806.46

Table 20 Average Demand Served by Post-Decision Rollout with Dynamic Decomposition.

Duration Capacity	short			medium			long		
	small	medium	large	small	medium	large	small	medium	large
<b>Low Variability</b>									
R101 (25)	156.26	221.93	278.66	237.91	325.84	332.00	311.63	331.99	332.04
C101 (25)	223.96	299.13	320.02	317.38	455.06	459.63	391.46	459.18	459.64
R101 (50)	359.02	501.27	633.27	524.66	717.17	720.83	665.88	721.07	721.15
C101 (50)	339.09	541.50	606.69	545.36	801.51	859.55	679.14	859.33	859.92
R101 (75)	595.84	833.94	1011.38	842.77	1077.51	1078.40	1039.19	1078.35	1078.39
C101 (75)	760.51	1099.63	1296.00	1073.95	1359.68	1359.98	1303.15	1360.04	1360.05
R101 (100)	809.53	1146.83	1378.29	1151.75	1457.83	1458.52	1394.86	1458.23	1458.60
C101 (100)	923.33	1351.62	1652.40	1308.04	1803.19	1810.77	1641.75	1810.08	1810.84
<b>Moderate Variability</b>									
R101 (25)	149.61	217.27	273.13	226.70	314.25	331.26	295.36	331.50	331.61
C101 (25)	216.23	293.76	319.37	307.00	433.40	457.77	380.83	456.67	459.10
R101 (50)	334.25	487.99	611.33	503.13	695.85	720.29	636.56	720.38	720.39
C101 (50)	326.39	510.74	583.04	526.77	769.51	849.54	661.61	854.37	858.52
R101 (75)	566.48	794.78	965.82	809.52	1067.65	1077.28	998.05	1076.97	1077.52
C101 (75)	733.84	1057.77	1262.30	1040.91	1343.26	1357.55	1263.19	1359.97	1359.30
R101 (100)	774.60	1104.69	1329.85	1105.01	1442.80	1457.00	1349.28	1457.16	1457.33
C101 (100)	874.77	1307.01	1603.55	1276.48	1771.09	1808.20	1589.01	1808.83	1809.89
<b>High Variability</b>									
R101 (25)	142.74	204.30	262.06	214.86	297.55	329.60	280.97	331.21	331.71
C101 (25)	197.82	281.34	310.66	293.88	402.64	454.85	369.72	453.37	459.39
R101 (50)	318.41	465.72	577.62	482.15	661.29	715.81	611.32	715.35	716.91
C101 (50)	314.61	481.46	567.79	497.38	713.01	824.45	636.96	838.04	854.95
R101 (75)	528.21	760.66	913.60	776.42	1043.18	1075.35	968.30	1075.28	1075.59
C101 (75)	698.57	1013.16	1196.04	1005.96	1323.39	1359.85	1220.65	1358.81	1360.58
R101 (100)	727.21	1043.20	1258.31	1056.54	1412.06	1451.90	1309.02	1452.23	1452.83
C101 (100)	823.56	1239.84	1518.80	1230.54	1689.25	1800.98	1541.30	1803.36	1806.46

Table 21 Average Demand Served by Pre-Decision Rollout with Dynamic Decomposition.

Duration Capacity	short			medium			long		
	small	medium	large	small	medium	large	small	medium	large
<b>Low Variability</b>									
R101 (25)	156.26	221.93	278.66	237.90	325.84	332.01	311.75	332.02	332.04
C101 (25)	223.96	299.13	320.02	317.46	455.06	459.63	391.47	459.22	459.64
R101 (50)	359.21	501.27	633.27	524.09	716.86	721.05	665.75	721.08	721.15
C101 (50)	339.47	541.44	606.69	545.18	801.94	859.51	679.33	859.31	859.90
R101 (75)	595.51	833.92	1011.44	841.94	1077.82	1078.35	1038.42	1078.28	1078.41
C101 (75)	760.65	1099.16	1296.11	1073.93	1359.56	1359.95	1302.97	1360.04	1360.05
R101 (100)	809.33	1147.04	1378.25	1151.18	1457.89	1458.50	1395.29	1458.53	1458.60
C101 (100)	923.63	1351.49	1653.11	1307.86	1803.39	1810.77	1642.03	1810.73	1810.84
<b>Moderate Variability</b>									
R101 (25)	149.39	216.77	273.16	226.17	314.29	331.39	295.31	331.54	331.61
C101 (25)	216.38	293.81	319.35	306.87	433.79	457.76	379.54	457.04	459.23
R101 (50)	333.92	488.15	611.06	502.65	696.01	720.36	635.98	720.39	720.47
C101 (50)	326.27	511.21	582.85	526.21	769.39	849.37	661.36	854.33	858.52
R101 (75)	566.21	794.35	966.37	808.44	1067.50	1077.27	997.67	1076.78	1077.49
C101 (75)	733.26	1058.98	1263.53	1040.80	1343.30	1357.73	1263.66	1360.02	1359.30
R101 (100)	773.23	1104.25	1329.93	1103.67	1443.20	1457.20	1348.84	1457.18	1457.34
C101 (100)	873.76	1306.69	1602.97	1275.28	1772.29	1808.49	1589.20	1809.13	1809.89
<b>High Variability</b>									
R101 (25)	142.18	204.14	262.06	214.97	297.53	329.69	280.67	331.30	331.70
C101 (25)	197.57	281.16	310.74	294.00	401.96	454.70	368.89	453.32	459.39
R101 (50)	318.66	465.91	577.92	481.72	661.64	715.80	610.90	715.50	716.93
C101 (50)	314.21	480.98	567.51	497.66	714.06	824.24	636.36	837.93	854.92
R101 (75)	527.92	761.19	912.93	775.31	1042.71	1075.15	967.25	1075.28	1075.63
C101 (75)	698.64	1014.01	1194.19	1004.33	1324.46	1359.92	1219.75	1358.74	1360.58
R101 (100)	727.80	1043.31	1256.91	1053.96	1411.22	1452.23	1308.12	1452.36	1452.86
C101 (100)	824.09	1240.64	1519.84	1228.25	1690.97	1800.92	1539.82	1803.69	1806.45

**Table 22 Average CPU Seconds Per Instance.**

Method	25 Customers Avg. CPU	50 Customers Avg. CPU	75 Customers Avg. CPU	100 Customers Avg. CPU
<b>No Decomposition</b>				
One-Step Rollout	42.70	–	–	–
Post-Decision Rollout	9.14	–	–	–
Pre-Decision Rollout	0.45	4.39	26.02	76.35
<b>Static Decomposition</b>				
One-Step Rollout	0.85	5.29	18.42	30.82
Post-Decision Rollout	0.25	0.89	3.52	6.11
Pre-Decision Rollout	0.01	0.02	0.02	0.14
<b>Dynamic Decomposition</b>				
One-Step Rollout	1.27	9.60	43.49	104.81
Post-Decision Rollout	0.53	5.29	29.70	81.75
Pre-Decision Rollout	0.41	4.94	27.94	80.53

**Table 23 Average Demand Served by One-Step Rollout with Random Heuristic and High Quality Initial Policy.**

Duration Capacity	short			medium			long		
	small	medium	large	small	medium	large	small	medium	large
<b>Low Variability</b>									
R101 (25)	156.15	221.93	278.66	236.94	325.38	332.02	309.90	332.02	332.02
C101 (25)	222.73	298.98	320.02	317.07	454.86	459.62	391.13	459.17	459.37
<b>Moderate Variability</b>									
R101 (25)	147.80	216.29	273.14	223.96	312.88	331.02	290.00	331.42	331.56
C101 (25)	210.10	292.63	319.24	301.72	429.32	457.58	375.99	457.67	459.03
<b>High Variability</b>									
R101 (25)	141.69	202.92	262.09	210.27	293.16	328.92	274.64	330.58	331.40
C101 (25)	185.77	273.41	309.12	283.66	399.24	452.93	360.26	450.94	459.37

**Table 24 Average Demand Served by Post-Decision Rollout with Random Heuristic and High Quality Initial Policy.**

Duration Capacity	short			medium			long		
	small	medium	large	small	medium	large	small	medium	large
<b>Low Variability</b>									
R101 (25)	156.15	221.93	278.66	237.22	325.39	332.01	309.94	332.01	332.04
C101 (25)	222.44	299.07	320.02	317.10	454.86	459.64	391.11	459.20	459.64
<b>Moderate Variability</b>									
R101 (25)	147.83	216.34	273.18	223.85	313.10	331.14	290.11	331.43	331.61
C101 (25)	211.77	292.83	319.23	302.32	431.09	457.73	376.07	457.78	459.21
<b>High Variability</b>									
R101 (25)	141.38	202.91	262.10	210.45	293.35	329.05	274.80	330.48	331.72
C101 (25)	186.01	274.23	308.90	284.19	399.34	453.02	360.41	451.21	459.57

**Table 25** Average Demand Served by Pre-Decision Rollout with Random Heuristic and High Quality Initial Policy.

Duration Capacity	short			medium			long		
	small	medium	large	small	medium	large	small	medium	large
<b>Low Variability</b>									
R101 (25)	156.15	221.93	278.66	236.91	325.40	332.01	310.46	332.00	332.04
C101 (25)	222.50	298.87	320.02	317.07	454.80	459.58	391.09	459.16	459.64
R101 (50)	355.49	501.20	632.47	520.38	716.59	721.04	662.16	720.93	721.15
C101 (50)	336.78	541.30	606.40	543.53	801.36	859.40	677.00	858.98	859.90
R101 (75)	593.76	831.77	1010.37	837.72	1077.56	1078.20	1034.31	1077.53	1078.27
C101 (75)	756.57	1097.16	1294.44	1067.95	1358.25	1359.85	1300.04	1359.80	1360.05
R101 (100)	804.14	1146.33	1376.46	1141.00	1456.94	1458.22	1383.87	1456.98	1458.53
C101 (100)	918.81	1349.53	1648.26	1304.86	1802.20	1810.47	1630.34	1809.80	1810.61
<b>Moderate Variability</b>									
R101 (25)	147.75	216.06	273.03	223.32	312.92	330.94	288.49	331.43	331.61
C101 (25)	208.42	292.59	319.06	300.68	426.83	457.56	372.45	456.19	459.01
R101 (50)	329.98	486.24	610.11	494.38	690.87	719.51	620.26	719.44	720.33
C101 (50)	322.04	505.94	581.77	508.04	764.84	846.47	644.71	850.86	857.48
R101 (75)	558.12	791.91	962.35	793.13	1059.87	1076.42	975.88	1075.38	1077.00
C101 (75)	712.04	1046.65	1254.17	1015.28	1334.29	1357.07	1229.46	1358.65	1359.29
R101 (100)	755.12	1094.05	1326.28	1078.45	1435.32	1456.24	1314.21	1455.65	1456.35
C101 (100)	842.98	1293.06	1580.33	1229.09	1748.83	1806.67	1539.47	1805.71	1809.33
<b>High Variability</b>									
R101 (25)	140.97	202.59	261.95	208.99	292.06	328.26	271.25	329.60	331.66
C101 (25)	184.85	272.76	306.81	280.73	396.49	449.63	348.90	447.74	458.80
R101 (50)	310.13	458.79	571.85	461.85	652.44	713.25	582.86	713.09	716.71
C101 (50)	303.07	474.69	559.07	470.09	694.69	818.60	603.12	821.78	854.49
R101 (75)	508.81	752.55	902.19	747.24	1024.29	1071.62	924.26	1072.75	1075.40
C101 (75)	656.74	979.14	1178.18	951.59	1291.56	1356.21	1145.70	1355.89	1360.20
R101 (100)	697.34	1020.06	1241.22	1007.47	1379.15	1449.76	1236.36	1449.04	1451.56
C101 (100)	778.99	1207.71	1481.94	1149.98	1635.31	1792.85	1440.16	1788.52	1804.77

**Table 26** Average Demand Served by One-Step Rollout with Random Heuristic and Low Quality Initial Policy.

Duration Capacity	short			medium			long		
	small	medium	large	small	medium	large	small	medium	large
<b>Low Variability</b>									
R101 (25)	139.09	168.58	169.42	190.73	244.85	289.98	260.18	326.97	326.58
C101 (25)	189.90	247.86	262.84	276.43	373.01	417.69	354.41	456.08	459.62
<b>Moderate Variability</b>									
R101 (25)	112.63	135.55	152.97	186.11	246.35	270.99	251.35	311.70	316.40
C101 (25)	154.81	243.66	276.90	266.50	379.16	431.17	340.90	445.31	458.88
<b>High Variability</b>									
R101 (25)	100.95	170.81	179.24	188.72	245.36	257.88	241.03	287.83	323.12
C101 (25)	158.74	232.32	280.97	246.18	347.93	426.73	343.58	443.89	459.32

**Table 27** Average Demand Served by Post-Decision Rollout with Random Heuristic and Low Quality Initial Policy.

Duration Capacity	short			medium			long		
	small	medium	large	small	medium	large	small	medium	large
<b>Low Variability</b>									
R101 (25)	126.12	137.59	193.97	188.98	253.47	278.00	255.24	295.16	318.62
C101 (25)	185.84	240.37	289.01	271.56	369.29	410.34	336.86	449.41	459.62
<b>Moderate Variability</b>									
R101 (25)	91.18	127.39	148.32	192.46	245.93	246.68	259.27	310.94	323.72
C101 (25)	163.31	253.83	290.97	265.91	342.53	422.83	340.15	454.18	459.03
<b>High Variability</b>									
R101 (25)	101.85	166.06	166.89	183.73	239.83	220.32	236.24	298.86	314.73
C101 (25)	159.38	236.36	263.47	249.39	356.71	417.08	340.84	444.31	457.93

**Table 28 Average Demand Served by Pre-Decision Rollout with Random Heuristic and Low Quality Initial Policy.**

Duration Capacity	short			medium			long		
	small	medium	large	small	medium	large	small	medium	large
<b>Low Variability</b>									
R101 (25)	132.49	77.98	104.23	163.12	216.48	224.66	216.99	272.08	245.45
C101 (25)	137.04	218.49	199.25	231.91	286.66	324.77	326.13	394.40	443.70
R101 (50)	187.98	216.38	265.55	360.56	389.52	491.52	445.27	546.92	623.13
C101 (50)	212.07	181.01	284.95	375.63	467.39	467.38	495.42	691.06	603.31
R101 (75)	308.03	480.77	435.88	473.39	695.16	685.40	685.02	924.14	969.37
C101 (75)	435.31	549.71	624.06	747.64	946.05	1044.58	892.97	1117.04	1160.22
R101 (100)	337.06	471.57	586.29	752.75	882.84	999.21	954.10	1190.77	1166.73
C101 (100)	474.52	726.02	805.69	824.94	1032.82	1138.58	1204.42	1453.58	1504.07
<b>Moderate Variability</b>									
R101 (25)	81.07	74.75	111.93	166.40	220.70	179.95	233.24	284.11	297.09
C101 (25)	135.26	201.33	220.90	212.64	333.83	354.06	286.33	415.91	451.18
R101 (50)	171.99	236.66	203.52	342.53	427.08	479.16	461.59	571.25	591.48
C101 (50)	219.97	249.54	293.23	298.28	417.91	470.09	478.70	643.59	678.04
R101 (75)	268.20	372.73	395.50	567.14	657.78	653.89	744.66	826.53	905.17
C101 (75)	437.69	511.63	595.78	710.68	854.67	1005.56	862.55	1120.36	1261.56
R101 (100)	394.49	525.11	510.02	713.52	828.37	914.20	999.79	1113.42	1217.49
C101 (100)	523.86	617.50	726.19	804.05	1016.49	1054.15	1119.80	1338.11	1542.41
<b>High Variability</b>									
R101 (25)	79.08	129.83	139.10	167.03	197.55	182.61	214.58	207.26	293.00
C101 (25)	110.70	170.16	209.18	207.85	296.98	358.54	276.35	385.09	433.66
R101 (50)	202.57	184.22	280.36	275.26	373.05	396.64	437.18	538.64	584.31
C101 (50)	162.30	244.79	279.43	332.22	437.33	464.68	464.95	586.77	658.86
R101 (75)	299.76	397.22	376.09	478.67	663.89	707.77	706.95	843.65	926.92
C101 (75)	357.11	570.48	595.11	641.05	951.79	902.88	881.27	1069.45	1203.04
R101 (100)	382.19	491.48	525.51	634.02	870.38	919.92	829.12	1075.07	1222.25
C101 (100)	444.63	646.63	682.38	795.93	906.18	1117.25	1080.73	1351.25	1430.15

**Table 29 Average Demand Served by One-Step Rollout with Local Search Heuristic and Low Quality Initial Policy.**

Duration Capacity	short			medium			long		
	small	medium	large	small	medium	large	small	medium	large
<b>Low Variability</b>									
R101 (25)	143.27	196.03	223.80	234.87	308.25	330.77	300.39	331.97	332.01
C101 (25)	205.03	298.21	299.93	314.54	434.60	459.46	385.14	458.64	459.63
<b>Moderate Variability</b>									
R101 (25)	118.54	182.24	204.84	222.41	303.68	325.51	292.93	330.84	331.53
C101 (25)	177.14	280.73	300.48	303.80	422.86	457.47	374.57	458.70	458.83
<b>High Variability</b>									
R101 (25)	107.49	195.91	231.09	215.13	292.32	312.10	276.51	329.93	331.67
C101 (25)	175.81	268.90	312.72	281.40	403.86	451.71	371.73	452.08	459.98

**Table 30 Average Demand Served by Post-Decision Rollout with Local Search Heuristic and Low Quality Initial Policy.**

Duration Capacity	short			medium			long		
	small	medium	large	small	medium	large	small	medium	large
<b>Low Variability</b>									
R101 (25)	142.79	194.18	229.62	236.85	310.32	331.39	304.89	331.79	331.99
C101 (25)	200.83	298.86	300.00	315.45	443.74	459.46	380.81	458.98	459.63
<b>Moderate Variability</b>									
R101 (25)	119.71	183.46	209.10	225.48	303.95	324.44	292.20	331.11	331.45
C101 (25)	178.39	276.65	300.91	305.62	421.20	457.77	376.11	458.81	458.93
<b>High Variability</b>									
R101 (25)	108.86	195.70	230.28	213.80	292.57	312.01	274.58	330.00	331.57
C101 (25)	175.06	266.28	311.26	281.27	402.46	451.32	370.07	452.58	459.97

**Table 31** Average Demand Served by Pre-Decision Rollout with Local Search Heuristic and Low Quality Initial Policy.

Duration Capacity	short			medium			long		
	small	medium	large	small	medium	large	small	medium	large
<b>Low Variability</b>									
R101 (25)	139.12	196.21	209.85	216.80	284.09	316.94	295.26	331.98	332.01
C101 (25)	195.26	268.85	270.05	297.50	416.17	459.29	377.46	458.31	459.62
R101 (50)	293.22	408.92	542.69	495.48	681.97	694.70	623.17	720.31	720.87
C101 (50)	299.39	487.07	588.08	505.89	709.19	775.02	646.59	855.10	859.34
R101 (75)	521.87	728.68	864.26	777.35	1061.76	1059.13	964.02	1078.04	1074.09
C101 (75)	677.68	1011.09	1188.52	992.54	1343.31	1359.41	1252.69	1359.07	1360.05
R101 (100)	653.48	1005.22	1246.72	1049.08	1425.87	1456.45	1313.18	1458.41	1458.57
C101 (100)	754.43	1199.32	1452.48	1195.40	1691.50	1787.66	1537.69	1810.41	1810.77
<b>Moderate Variability</b>									
R101 (25)	116.14	174.35	176.09	220.92	280.23	297.39	285.97	329.67	331.35
C101 (25)	172.50	279.19	297.26	298.10	414.40	455.48	368.39	455.81	458.81
R101 (50)	291.15	428.66	533.24	465.39	626.67	696.80	612.62	716.07	720.28
C101 (50)	309.06	443.90	537.97	482.63	698.81	789.58	638.66	844.36	858.20
R101 (75)	452.27	718.36	856.91	780.16	1033.13	1058.90	966.84	1076.18	1077.50
C101 (75)	660.71	967.78	1173.75	974.42	1316.61	1347.14	1225.73	1356.42	1360.04
R101 (100)	671.45	993.96	1246.24	1053.50	1376.74	1449.12	1301.85	1455.54	1457.21
C101 (100)	766.32	1217.22	1436.74	1215.59	1667.20	1800.42	1529.31	1803.82	1809.18
<b>High Variability</b>									
R101 (25)	109.61	195.41	219.14	213.12	277.15	302.10	272.15	326.04	331.40
C101 (25)	169.01	264.90	300.51	276.92	397.80	447.47	366.01	450.30	459.99
R101 (50)	290.51	393.84	488.00	453.88	616.21	673.51	599.37	708.32	716.74
C101 (50)	247.51	444.18	529.85	486.26	673.23	780.83	623.86	829.67	851.62
R101 (75)	480.08	697.26	850.07	744.92	986.39	1065.57	944.51	1072.58	1075.62
C101 (75)	645.31	970.04	1141.26	965.10	1304.16	1356.17	1190.92	1356.27	1360.54
R101 (100)	628.55	959.50	1165.60	1015.45	1357.53	1437.42	1270.79	1445.89	1452.81
C101 (100)	775.46	1206.02	1400.92	1176.40	1628.64	1778.19	1495.75	1790.91	1804.53

**Table 32** Average Demand Served by One-Step Rollout with Variable Neighborhood Search Heuristic and High Quality Initial Policy.

Duration Capacity	short			medium			long		
	small	medium	large	small	medium	large	small	medium	large
<b>Low Variability</b>									
R101 (25)	156.27	221.97	278.66	238.15	324.66	331.99	312.70	331.97	331.99
C101 (25)	224.13	299.07	320.02	317.52	455.22	459.42	391.72	459.21	459.62
<b>Moderate Variability</b>									
R101 (25)	149.92	217.48	273.20	228.68	315.03	331.34	297.57	331.32	331.53
C101 (25)	217.35	293.66	319.47	307.64	434.16	458.03	385.10	456.57	458.93
<b>High Variability</b>									
R101 (25)	144.75	205.71	262.16	217.58	296.90	329.50	282.51	330.81	331.54
C101 (25)	203.84	280.57	312.41	299.76	409.96	454.26	373.35	453.30	459.36

**Table 33** Average Demand Served by Post-Decision Rollout with Variable Neighborhood Search Heuristic and High Quality Initial Policy.

Duration Capacity	short			medium			long		
	small	medium	large	small	medium	large	small	medium	large
<b>Low Variability</b>									
R101 (25)	156.16	221.94	278.66	237.84	325.73	332.02	311.79	331.87	331.97
C101 (25)	224.04	299.14	320.04	317.30	454.94	458.84	391.78	459.29	459.51
<b>Moderate Variability</b>									
R101 (25)	149.73	216.76	273.18	228.16	314.45	331.34	295.96	330.90	331.44
C101 (25)	216.74	293.29	319.38	306.73	434.42	457.48	381.97	456.44	459.00
<b>High Variability</b>									
R101 (25)	144.33	203.65	261.99	214.80	297.19	329.34	281.04	330.78	331.64
C101 (25)	203.67	280.13	311.35	297.58	406.11	453.88	369.91	453.12	459.35

**Table 34 Average Demand Served by Pre-Decision Rollout with Variable Neighborhood Search Heuristic and High Quality Initial Policy.**

Duration Capacity	short			medium			long		
	small	medium	large	small	medium	large	small	medium	large
<b>Low Variability</b>									
R101 (25)	156.27	221.93	278.66	237.32	325.40	332.01	310.68	332.02	332.04
C101 (25)	223.59	298.97	320.02	317.08	454.80	458.89	391.21	459.24	459.64
R101 (50)	359.04	501.21	632.52	523.75	716.77	721.05	663.49	721.06	721.15
C101 (50)	339.34	541.36	606.52	543.89	801.46	859.47	677.41	859.17	859.91
R101 (75)	595.01	832.99	1010.60	839.79	1077.66	1078.26	1035.17	1077.90	1078.40
C101 (75)	759.68	1098.42	1294.70	1070.33	1359.14	1359.92	1301.52	1360.03	1360.05
R101 (100)	808.28	1146.63	1376.81	1144.74	1457.27	1458.44	1387.27	1458.15	1458.60
C101 (100)	923.01	1351.92	1649.03	1306.63	1804.02	1810.66	1633.45	1809.98	1810.83
<b>Moderate Variability</b>									
R101 (25)	149.45	216.95	273.20	225.92	313.48	331.28	294.11	331.34	331.61
C101 (25)	215.77	293.30	319.31	304.22	431.24	457.79	378.42	457.23	459.23
R101 (50)	332.39	487.05	610.56	499.88	694.03	720.07	628.84	720.11	720.47
C101 (50)	328.08	509.00	582.59	518.13	765.66	847.90	653.64	853.89	858.35
R101 (75)	565.08	792.75	963.92	803.36	1063.61	1076.80	989.36	1076.44	1077.49
C101 (75)	728.57	1050.84	1257.77	1027.16	1341.25	1357.94	1252.72	1359.93	1359.45
R101 (100)	770.09	1099.90	1327.86	1092.41	1439.93	1456.69	1331.08	1456.28	1457.17
C101 (100)	868.88	1301.46	1589.85	1255.32	1763.09	1807.79	1570.31	1808.32	1809.78
<b>High Variability</b>									
R101 (25)	142.13	203.68	262.10	215.29	294.02	329.18	278.94	330.55	331.70
C101 (25)	198.77	278.74	310.25	291.58	402.61	454.84	368.12	452.82	459.34
R101 (50)	317.86	463.98	575.06	479.49	660.32	714.76	607.18	715.22	716.88
C101 (50)	314.59	477.66	565.33	493.29	706.10	821.04	633.11	835.45	854.82
R101 (75)	522.63	756.31	907.13	772.34	1033.27	1074.47	957.86	1074.78	1075.57
C101 (75)	691.07	1002.23	1183.76	985.39	1316.55	1358.98	1202.00	1357.80	1360.54
R101 (100)	721.00	1034.13	1249.64	1048.12	1393.00	1451.35	1289.19	1451.09	1452.82
C101 (100)	814.20	1230.49	1501.26	1205.63	1669.21	1798.50	1508.56	1802.21	1805.79

**Table 35 Average Demand Served by One-Step Rollout with Variable Neighborhood Search Heuristic and Low Quality Initial Policy.**

Duration Capacity	short			medium			long		
	small	medium	large	small	medium	large	small	medium	large
<b>Low Variability</b>									
R101 (25)	143.29	193.08	232.77	229.56	298.50	327.35	297.95	332.03	331.99
C101 (25)	204.85	297.77	299.86	313.20	448.34	459.52	385.85	459.37	459.64
<b>Moderate Variability</b>									
R101 (25)	116.84	179.62	204.13	224.10	299.32	316.42	292.81	331.01	331.49
C101 (25)	179.26	281.77	300.53	304.64	422.95	457.72	378.73	458.78	458.91
<b>High Variability</b>									
R101 (25)	109.95	197.03	228.82	215.95	291.68	307.10	276.78	329.04	331.65
C101 (25)	176.03	269.49	311.49	281.23	402.27	451.04	371.09	452.06	459.96

**Table 36 Average Demand Served by Post-Decision Rollout with Variable Neighborhood Search Heuristic and Low Quality Initial Policy.**

Duration Capacity	short			medium			long		
	small	medium	large	small	medium	large	small	medium	large
<b>Low Variability</b>									
R101 (25)	143.23	195.11	227.24	229.61	303.88	327.57	301.56	331.95	331.98
C101 (25)	204.76	297.88	300.00	314.96	437.72	459.49	384.91	459.17	459.62
<b>Moderate Variability</b>									
R101 (25)	116.69	183.42	208.66	222.20	297.30	319.49	290.64	330.95	331.49
C101 (25)	177.47	284.84	300.50	303.20	420.61	457.71	376.72	458.76	458.84
<b>High Variability</b>									
R101 (25)	106.23	195.12	226.53	212.95	288.94	307.56	275.31	329.37	331.60
C101 (25)	173.69	264.42	310.38	280.22	399.08	451.10	368.36	451.67	459.99

**Table 37** Average Demand Served by Pre-Decision Rollout with Variable Neighborhood Search Heuristic and Low Quality Initial Policy.

Duration Capacity	short			medium			long		
	small	medium	large	small	medium	large	small	medium	large
<b>Low Variability</b>									
<b>R101 (25)</b>	142.89	192.54	218.29	216.35	296.29	316.42	297.35	331.69	332.01
<b>C101 (25)</b>	196.26	289.26	296.97	297.62	423.40	459.05	379.07	459.22	459.64
<b>R101 (50)</b>	305.27	423.39	557.71	482.94	654.65	686.62	620.51	720.64	720.93
<b>C101 (50)</b>	306.17	475.15	571.89	499.10	712.85	826.03	643.64	851.81	859.21
<b>R101 (75)</b>	534.63	738.25	848.68	785.62	1019.21	1058.30	974.35	1078.32	1078.38
<b>C101 (75)</b>	676.88	996.71	1192.65	990.96	1332.91	1354.16	1240.57	1359.44	1360.03
<b>R101 (100)</b>	652.06	1012.47	1182.86	1052.57	1381.58	1441.39	1321.52	1458.15	1458.48
<b>C101 (100)</b>	771.81	1226.84	1487.96	1207.08	1689.89	1765.98	1534.50	1809.44	1810.59
<b>Moderate Variability</b>									
<b>R101 (25)</b>	117.30	178.21	199.66	219.08	290.72	310.20	287.67	330.22	331.55
<b>C101 (25)</b>	177.25	279.28	300.05	299.20	415.32	456.49	368.74	457.98	459.13
<b>R101 (50)</b>	295.56	443.09	528.59	471.11	636.67	687.83	614.07	715.75	720.40
<b>C101 (50)</b>	309.86	424.41	529.42	481.60	690.08	803.73	640.12	839.44	858.06
<b>R101 (75)</b>	475.10	718.45	845.18	778.16	1002.80	1052.10	959.90	1076.31	1077.42
<b>C101 (75)</b>	664.95	973.10	1179.69	974.43	1293.24	1352.53	1221.42	1358.75	1360.49
<b>R101 (100)</b>	666.45	985.50	1178.08	1044.39	1354.82	1424.41	1296.30	1455.31	1457.20
<b>C101 (100)</b>	780.64	1211.78	1459.91	1206.70	1655.12	1777.29	1514.45	1803.17	1809.24
<b>High Variability</b>									
<b>R101 (25)</b>	104.65	189.90	224.80	211.34	284.40	300.64	273.16	327.25	331.63
<b>C101 (25)</b>	170.31	258.22	305.61	278.91	397.33	446.45	366.93	451.27	459.98
<b>R101 (50)</b>	292.25	412.37	508.01	452.08	619.24	670.41	595.57	706.27	716.63
<b>C101 (50)</b>	253.47	438.07	528.14	484.76	665.17	789.82	621.36	818.19	853.23
<b>R101 (75)</b>	479.76	704.93	839.25	747.32	977.11	1044.40	940.28	1072.28	1075.53
<b>C101 (75)</b>	648.97	958.43	1135.94	956.01	1283.97	1348.34	1189.68	1356.51	1360.52
<b>R101 (100)</b>	628.13	960.97	1143.07	1015.23	1325.16	1411.81	1258.76	1447.51	1452.73
<b>C101 (100)</b>	775.62	1186.93	1394.33	1166.70	1604.52	1746.24	1482.95	1787.76	1805.74