Tables

Table 1 – Example Dwell Time Calculations and Resampling from NETMIS Data

Victoria Station Northbound Example Data			Resampled Data	
Arrive	**Depart**	**Dwell**	**Resample time**	**Dwell**
06:00:00	06:00:30	00:00:30		
06:01:10	06:01:25	00:00:15		
06:01:50	06:02:30	00:00:40		
06:03:00	06:03:25	00:00:25	06:02:00	00:00:28
06:03:55	06:04:45	00:00:50	06:04:00	00:00:38
06:05:00	06:05:30	00:00:30	06:06:00	00:00:30

Table 2 - Data on service affecting failures on the London Underground. Primary data gathered by analysing internal London Underground CUPID data.

Line Ops	Direction	Number of Service Affecting Failures (over 2330 days)	Mean Delay Time (minutes)	Failure Rate (failures per day)	Total Downtime (days)	Line Availability
Bakerloo	NB	4,017	6.10	1.72	17.01	0.9928
Bakerloo	SB	3,246	6.16	1.39	13.88	0.9941
Central	EB	11,170	6.14	4.79	47.61	0.9800
Central	WB	9,703	5.56	4.16	37.49	0.9842
Jubilee	EB	7,452	5.28	3.20	27.31	0.9884
Jubilee	WB	9,941	4.67	4.27	32.27	0.9863
Metropolitan	NB	5,683	7.14	2.44	28.17	0.9881
Metropolitan	SB	7,539	6.81	3.24	35.66	0.9849
Northern	NB	8,133	5.02	3.49	28.34	0.9880
Northern	SB	7,849	5.22	3.37	28.45	0.9879
Piccadilly	WB	7,164	6.17	3.07	30.70	0.9870
Piccadilly	EB	6,266	6.24	2.69	27.14	0.9885
Victoria	NB	6,246	4.57	2.68	19.81	0.9916
Victoria	SB	5,026	4.94	2.16	17.23	0.9927

Line	Bakerloo	Central	Jubilee	Metropolitan	Northern	Piccadilly	Victoria
SAF Failure Rate*	6.389	14.294	12.624	7.929	13.005	9.607	6.844
*(mean number of incidents per day on line)							

Table 3 - Train service affecting failure rates of London Underground lines

Line	Bakerloo	Central	Jubilee	Metropol	Northern	Piccadilly	Victoria
Track Length (KM)	23.2	74	36,2	67	58	71	21
# Stations	25	49	27	34	50	53	16
Line Density	1.08	0.66	0.75	0.51	0.86	0.75	0.76
# Trains in Service	36	85	63	58	106	86	47
Train Density	33.41	128.37	84,47	114.29	122.96	115.2	58
Seating capacity (per/train)	268	272	234	306	200	228	252
Standing capacity (m^2)	116.6	155.02	145.92	174	110.36	114	153.2

Table 4 - The train density calculations

Station	Stockwell	Vauxhall	Pimlico	Victoria	Green Park	Oxford Circus	Warren Street	Euston	Kings Cross	Highbury & Islington	Finsbury Park	Seven Sisters	Tottenham Hale	Blackhorse Road
RORIF (s)	48	51	53	45	46	45	55	47	51	50	49	52	53	52
Boarders & Alighter	3070	1669	570	3305	1947	3677	952	1164	1272	888	821	459	202	100

Table 5 - RORIF and peak boarders and alighters for Victoria Line

Factor	Pearson Correlation with Mean Dwell Time	Spearman Correlation with Mean Dwell Time
Mean Dwell Time	1	1
Mean Boarders and Alighters	0.597	0.602
Service Affecting Failure Rate for Line and Direction of Travel	0.267	0.252
Train Density on the Line	-0.077	-0.033
Standing Capacity of Train	-0.027	-0.081
Seating Capacity of Train	-0.191	-0.124

Table 6 - Pearson and spearman correlation coefficient results for different factors

Regression Model	R-squared Score (p = 0 for all results)	Best Validation Correlation Score (p = 0 for all results)
Multiple Linear Regression	0.43	0.66
K-Nearest Neighbours	0.56	0.71
Decision Tree	0.73	0.52
Neural Network	0.48	0.7

Table 7 - Summary results of regression models tested

Regression Model	R-squared Score (p = 0 for all results)	Best Validation Correlation Score (p = 0 for all results)
Multiple Linear Regression	0.43	0.66
K-Nearest Neighbours	0.56	0.71
Decision Tree	0.73	0.52
Neural Network	0.48	0.7