EXHIBIT 1

APPENDIX 1: STATISTICAL PROCEDURES

All statistical tests will be one-tailed tests and will be constructed so that a positive sign indicates poorer performance.

In calculating the difference between the performances the formulae proposed below apply when a lower CLEC value indicates a higher quality of performance. However, if a higher CLEC value indicates a higher quality of performance the order of subtraction should be reversed (i.e., $M_{ILEC} - M_{CLEC}$, $P_{ILEC} - P_{CLEC}$, $R_{ILEC} - R_{CLEC}$, $M_{ILEC} - B$, $P_{ILEC} - B$, $R_{ILEC} - B$).

Parity Tests:

The following parity tests will be used:

Percent/Proportion	Rate/Ratio	Average/Mean
Large sample parity tests		
Sample Size ≥ 30 and the expected misses > 5 for both CLEC and AT&T • Classical z-test for equality of proportions	**Sample Size ≥ 30** • Modified z-test for equality of rates	**Sample Size ≥ 30** • Two Sample Modified z-test
Small sample parity tests		
Sample Size < 30 or the expected misses ≤ 5 for either CLEC or AT&T • Classical z-test for equality of proportions or Fisher's Exact Test*	**Sample Size < 30 for either CLEC or AT&T** • Modified z-test for equality of rates or Binomial Exact test with proportion of CLEC items in denominator*	**Sample Size < 30 for either CLEC or AT&T** • Two Sample Modified t-test

*Although exact tests are preferred, AT&T reserves the right to perform large sample tests on small samples where calculations of large factorials are required.

For measurement results that are expressed as **Averages or Means** the modified t-test with df=n_{ILEC}-1 degrees of freedom will be used:

$t = (DIFF) / \sigma_{DIFF}$,

where:

$DIFF = M_{CLEC} - M_{ILEC}$

M_{ILEC} = ILEC Average

M_{CLEC} = CLEC Average

$$\sigma_{DIFF} = \sqrt{\sigma^2_{ILEC}\left(\frac{1}{n_{ILEC}} + \frac{1}{n_{CLEC}}\right)}$$

σ^2_{ILEC} = calculated sample variance for ILEC.

n_{ILEC} = number of observations used in ILEC measurement

n_{CLEC} = number of observations used in CLEC measurement.

The t-statistic will be converted to a p-value (type I error probability) using a Student t distribution table or calculation. Degrees of freedom will be based only on the ILEC sample size. [1]If the obtained p-value is less

[1] Brownie, C., Boos, D., & Hughes-Oliver, J (1900) – Modifying the t and ANOVA F tests when treatment is expected to increase variability relative to controls.

than the critical p-value from the K-table, then the result will be deemed not in parity. For publishing purposes, the p-value will be converted to a standard normal z-value.

For measurement results that are expressed as **Percentages or Proportions**, Fisher's exact test[2], based on sampling without replacement model and following a hypergeometric distribution[3], is always preferred:

$$\Phi^{-1}(1-p) = \Phi^{-1}\left(\sum_{k=0}^{f_{CLEC}-1} Hypergeom(k \mid n_{CLEC}, f_{CLEC}+f_{ILEC}, n_{CLEC}+n_{ILEC})\right)$$

$$= \Phi^{-1}\left(\sum_{0}^{f_{CLEC}-1} \frac{\binom{n_{CLEC}}{k}\binom{n_{ILEC}}{f_{CLEC}+f_{ILEC}-k}}{\binom{n_{CLEC}+n_{ILEC}}{f_{CLEC}+f_{ILEC}}}\right),$$

where:
n_{CLEC} = number of observations used in CLEC measurement
n_{ILEC} = number of observations used in ILEC measurement
f_{CLEC} = number of CLEC failures or misses
f_{ILEC} = number of ILEC failures or misses
p = p-value = probability of f_{CLEC} or more CLEC failures, given margin totals
$\Phi^{-1}(\cdot)$ = the inverse cumulative standard normal function.

When the expected number of failures and expected number of passes are greater than 5 and when both sample sizes are at least 30, the classical test for equality of proportions[4], may be used (based on sampling with replacement model):

$z = (DIFF) / \sigma_{DIFF}$,

where:
$DIFF = P_{CLEC} - P_{ILEC}$

$$\sigma_{DIFF} = \sqrt{P_{POOL}(1-P_{POOL})\left(\frac{1}{n_{ILEC}}+\frac{1}{n_{CLEC}}\right)}$$

$$P_{POOL} = \frac{n_{ILEC}P_{ILEC}+n_{CLEC}P_{CLEC}}{n_{ILEC}+n_{CLEC}} = \frac{f_{ILEC}+f_{CLEC}}{n_{ILEC}+n_{CLEC}} \quad \text{(pooled proportion)}$$

n_{ILEC} = number of observations used in ILEC measurement
n_{CLEC} = number of observations used in CLEC measurement
$P_{ILEC} = f_{ILEC} / n_{ILEC}$ = ILEC Percentage or Proportion
$P_{CLEC} = f_{CLEC} / n_{CLEC}$ = CLEC Percentage or Proportion.
The classical z-test for proportions is preferred over the modified z test because the latter is undefined in the case of perfect ILEC performance.

Biometrics, 46, 259-266.
[2] Steel & Torrie, Section 22.5 "Fisher's Exact Test", p.504.
[3] Steel & Torrie, Section 23.2 "The Hypergeometric Distribution", p.521.
[4] Steel & Torrie, Section 22.4 "The 2 × 2 or Fourfold Table": Normal approximation, p.502

For measurement results that are expressed as **Rates or Ratios**, exact binomial test[5] based on CLEC market share is always preferred:

$$\Phi^{-1}(1-p) = \Phi^{-1}\left(\sum_{k=0}^{f_{CLEC}-1} Binom(k, f_{CLEC} + f_{ILEC}, \frac{n_{CLEC}}{n_{CLEC} + n_{ILEC}})\right)$$
$$= \Phi^{-1}\left(\sum_{k=0}^{f_{CLEC}-1} \binom{f_{CLEC} + f_{ILEC}}{k} c^k (1-c)^{f_{CLEC}+f_{ILEC}-k}\right),$$

where:

$c = \frac{n_{CLEC}}{n_{CLEC} + n_{ILEC}}$ = CLEC market share of denominator items
n_{CLEC} = number of items in CLEC denominator
n_{ILEC} = number of items in ILEC denominator
f_{CLEC} = number of CLEC troubles
f_{ILEC} = number of ILEC troubles
p = p-value = probability of f_{CLEC} or more CLEC troubles
$\Phi^{-1}(\cdot)$ = the inverse cumulative standard normal function.

The modified z-test for rates may be used for large samples, i.e. when both sample sizes are 30 or larger:

$z = (DIFF) / \sigma_{DIFF}$,
where:
$DIFF = R_{CLEC} - R_{ILEC}$

$$\sigma_{DIFF} = \sqrt{R_{POOL}\left(\frac{1}{n_{ILEC}} + \frac{1}{n_{CLEC}}\right)}$$

$$R_{POOL} = \frac{n_{ILEC}R_{ILEC} + n_{CLEC}R_{CLEC}}{n_{ILEC} + n_{CLEC}} = \frac{f_{ILEC} + f_{CLEC}}{n_{ILEC} + n_{CLEC}} \quad \text{(pooled rate)}$$

$R_{ILEC} = f_{ILEC}/n_{ILEC}$ = ILEC number of troubles per ILEC number of items
$R_{CLEC} = f_{CLEC}/n_{CLEC}$ = CLEC number of troubles per CLEC number of items.

The modified z-test assumes that the term (1 - R) in the variance estimate formula nR(1-R) is very close to 1, so it can be omitted. The modified z-test is assumed to asymptotically follow a standard normal distribution, so its value is directly compared to a critical z-value from the K-table.

Benchmark Tests:

Until feasible bright line benchmarks can be established based on the overall performance for all CLECs combined, taking into account the actual measurement distribution and type I error of 5%, the modified z-test for benchmarks will be used by setting the denominator of the large sample z-test formula as one:

$z = R_{CLEC} - B$,

Where R_{CLEC} is CLEC performance result and B is the established benchmark. The modified z-value will be compared to the critical z-value in the K-table. However, AT&T reserves the rights to perform the following exact benchmark tests in the future, if technically feasible:

[5] Steel & Torrie, Section 23.3 "The Binomial Distribution", p.523

Benchmarks (critical z-value applies)		
Percent/Proportion	**Rate/Ratio**	**Average/Mean**
• Binomial Exact test with B as proportion	• Poisson Exact test	• One sample t-test

For measurement results that are expressed as **Averages or Means** a one sample t-test with n_{CLEC}-1 degrees of freedom will be used:

$$t = \frac{M_{CLEC} - B}{\sqrt{\frac{\sigma^2_{CLEC}}{n_{CLEC}}}},$$

where:
B = Benchmark
M_{CLEC} = CLEC Average
σ^2_{CLEC} = Calculated sample variance for CLEC.
n_{CLEC} = number of observations used in CLEC measurement.

The t-statistic will be converted to a p-value (type I error probability) using a Student t distribution table or calculation with n_{CLEC}-1 degrees of freedom. If the obtained p-value is less than the critical p-value from the K-table, then the result will be deemed not in parity. For publishing purposes, the p-value will be converted to a standard normal z-value. For large sample sizes a normal approximation to Student t distribution may be used (one sample z-test).

For measurement results that are expressed as **Percentages or Proportions** a binomial exact test will be used if technically feasible. The test would take the form:

$$\Phi^{-1}(1-p) = \Phi^{-1}\left(\sum_{k=0}^{f_{CLEC}-1} Binom(k, n_{CLEC}, B)\right) = \Phi^{-1}\left(\sum_{k=0}^{f_{CLEC}-1} \binom{n_{CLEC}}{k} B^k (1-B)^{n_{CLEC}-k}\right),$$

where:
B = Benchmark
n_{CLEC} = number of observations used in CLEC measurement
f_{CLEC} = number of CLEC failures or misses
p = p-value = probability of f_{CLEC} or more CLEC failures
$\Phi^{-1}(\cdot)$ = the inverse cumulative standard normal function.
For large sample sizes ($n \geq 5/\min(B,1-B)$), a classical z test for population proportion may be used:

$$z = \frac{P_{CLEC} - B}{\sqrt{\frac{B(1-B)}{n_{CLEC}}}}$$

For measurement results that are expressed as **Rates or Ratios** a Poisson distribution[6] with mean equal to the expected number of failures ($n_{CLEC} \times B$) will be used if technically feasible for all sample sizes to perform an exact test as follows:

$$\Phi^{-1}(1-p) = \Phi^{-1}\left(\sum_{k=0}^{f_{CLEC}-1} Poisson(k-1, n_{CLEC}, B)\right) = \Phi^{-1}\left(\sum_{0}^{f_{CLEC}-1} \frac{(n_{CLEC} \cdot B)^k e^{-n_{CLEC} \cdot B}}{k!}\right),$$

where:
B = Benchmark
n_{CLEC} = number of items in CLEC denominator
f_{CLEC} = number of CLEC failures or misses (numerator)
p = p-value = probability of f_{CLEC} or more CLEC failures
$\Phi^{-1}(\cdot)$ = the inverse cumulative standard normal function.

For large sample sizes (n ≥ 10/min(B,1-B)), a z test for population rate (approximation to Poisson assuming mean=variance) may be used:

$$z = \frac{R_{CLEC} - B}{\sqrt{\frac{B}{n_{CLEC}}}}$$

Benchmarks for which critical z-value does not apply:

In cases where the critical z-value does not apply, the determination of compliance will be made by directly comparing the measured performance delivered to the CLEC to the applicable benchmark, subject to a small sample adjustment as defined in the following table:

Benchmarks (critical z-value does not apply)	
Percent/Proportion or Rate/Ratio	**Average/Mean**
Sample Size ≥ 5/min(B,1-B) • Direct comparison	**Sample Size ≥ 30** • Direct comparison
Sample Size < 5/min(B,1-B) • Use adjustment tables	**Sample Size < 30** • Eliminate the largest occurrence from the average calculation

For measurement results that are expressed as **Averages or Means** the largest occurrence (outlier) will be excluded from the calculation for sample sizes less than 30.

From the above table and from the chart below it is obvious that the adjustment is modest and negligible for sample sizes over 20.

[6] Steel & Torrie, Section 23.6 "The Poisson Distribution", p.528

For measurement results that are expressed as **Percentages or Proportions** the following small sample adjustment should be used:

10% Benchmark		5% Benchmark		1% Benchmark	
Sample size	Maximum permitted misses	Sample size	Maximum permitted misses	Sample size	Maximum permitted misses
1 to 7	1	1 to 14	1	1 to 70	1
8 to 16	2	15 to 32	2	71 to 162	2
17 to 27	3	33 to 54	3	163 to 272	3
28 to 39	4	55 to 78	4	273 to 392	4
40 to 50	5	79 to 100	5	393 to 500	5

The table can be expanded to accommodate any benchmark if necessary by using the same iterative process (described in AT&T white paper).

The same table should be used for benchmark **rates or ratios**.

K-Table:

The compliance procedure recognizes that there will always be random variation in the results. Due to simultaneous testing, a single test Type I error compounds fast as the number of performed tests in a single month for a particular CLEC increases. The overall acceptance level, alpha, is set to be exactly 0.05 for each CLEC. This means that the ILEC will be found non-compliant 5% of the time even if its systems are tuned to operate at perfect parity. Depending on the total number of tests performed in a month, the individual CLEC's critical p-value and a corresponding number of allowed missed submeasures K will be determined based on the following K-table. In most cases the statistical test p-value will have to be converted to a z-value via inverse standard normal cumulative distribution function:

z-value = $\Phi^{-1}(1-p)$

Conversely, each standard normal z-value yields the test's p-value as the probability of the right tail of the standard normal distribution:

p-value = $1-\Phi(z)$.

Critical Z - Statistic Table

Number of Performance Submeasures N	K Values	Critical Z-value
1	0	1.65
2	0	1.96
3	0	2.12
4	0	2.23
5	0	2.32
6	0	2.39
7	0	2.44
8	1	1.69
9	1	1.74
10-19	1	1.79
20-29	2	1.73
30-39	3	1.68
40-49	3	1.81
50-59	4	1.75
60-69	5	1.7
70 –79	6	1.68
80 – 89	6	1.74
90 – 99	7	1.71
100 – 109	8	1.68
110 –119	9	1.7
120 – 139	10	1.72
140 – 159	12	1.68
160 – 179	13	1.69
180 – 199	14	1.7
200 – 249	17	1.7
250 – 299	20	1.7
300 – 399	26	1.7
400 – 499	32	1.7
500 – 599	38	1.72
600 – 699	44	1.72
700 – 799	49	1.73
800 – 899	55	1.75
900 – 999	60	1.77
1000 and above	Calculated for Type-1 Error Probability of 5%	Calculated for Type-1 Error Probability of 5%