



# Erlang cheat sheet

Contact-centre staffing maths, on one page

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## The core idea

Offered load **A** = **contacts** × **AHT** ÷ **interval** (in Erlangs). It is the average number of agents fully occupied if there were no queue. Everything starts here.

## The models, in one line each

**Erlang B** — blocking only. Assumes a blocked caller goes away. Gives the chance all lines are busy. Used for trunk/line sizing.

**Erlang C** — the queueing workhorse. Assumes callers wait forever. Gives probability of waiting, ASA and service level for  $n$  agents. Tends to slightly over-staff because nobody really waits forever.

**Erlang A** — adds patience (abandonment). More realistic than C; usually lets you hit the same service with a touch fewer agents. Use it if you have abandonment data.

**Erlang X** — adds finite lines and redials on top of A. The most realistic; solved by iteration. Use when blocking and redials matter.

## Rules of thumb

**80/20 is a convention, not a law** — “80% answered in 20 seconds” has no scientific basis. Set the target to what your customers tolerate and what the contact is worth.

**The Power of One** — on a small team, a single agent up or down can swing service level dramatically. Big queues are far more stable (pooling).

**Occupancy is an output, not a target** — it falls out of staffing and your service target, and rises with size. Healthy band roughly 80–87% for voice; the low-90s is a warning, not a win.

**Net vs gross** — Erlang gives the net agents needed on the phones. Gross (rostered) = net ÷ (1 – shrinkage). Always staff gross.

*Try the live calculators at [ccplanning.net/calculators](http://ccplanning.net/calculators) — Erlang C, A and X.*