



Telecommunication Traffic System Formulas

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Examples!

Conversions!

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List of 22 Telecommunication Traffic System Formulas

Telecommunication Traffic System 🗗

1) Availability

$$A = \frac{u}{u+d}$$

Open Calculator

2) Average Holding Time

$$extstyle extstyle ext$$

Open Calculator

$$= 1.670007 s = \frac{2.5 \cdot 30 s}{44.91}$$

3) Average Number of Call

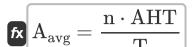
$$ext{fx} = rac{ ext{A}_{ ext{avg}} \cdot ext{T}}{ ext{AHT}}$$

Open Calculator





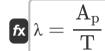
4) Average Occupancy



Open Calculator

 $\boxed{\mathbf{ex}} 2.49999 = \frac{44.91 \cdot 1.67s}{30s}$

5) Average Poisson Call Arrival Rate



Open Calculator

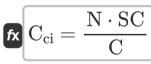
6) Call Setup Time

 $T_{
m cs} = T_{
m other} + K \cdot T_{
m st}$

Open Calculator

 $\boxed{0.353 \mathrm{s} = 0.11 \mathrm{s} + 3 \cdot 0.081 \mathrm{s} }$

7) Cost Capacity Index







8) Cost of Common Hardware

fx $m C_{ch} = C_{sw} - (n_{sw} \cdot C_s) - C_c$

Open Calculator 2

 $\mathbf{ex} \ 26.05 = 29 - (0.25 \cdot 2) - 2.45$

9) Cost of Switching System

fx $m C_{sw} = n_{sw} \cdot C_s + C_{ch} + C_c$

Open Calculator 2

 $\boxed{\texttt{ex}} \ 29 = 0.25 \cdot 2 + 26.05 + 2.45$

10) Cost per Subscriber

 $ext{fx} = rac{ ext{N} \cdot ext{SC}}{ ext{C}_{ci}}$

Open Calculator

 $= 16.6749 = \frac{15 \cdot 33.75}{30.36}$

11) Downtime

Open Calculator



12) Grade of Service

 $\operatorname{GoS} = rac{\mathrm{N_L}}{\mathrm{T_c}}$

Open Calculator

13) Number of Lost Call

fx $N_{
m L} = T_{
m c} \cdot {
m GoS}$

Open Calculator

14) Poisson Arrival

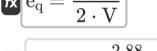
fx $ig[{
m A_p} = \lambda \cdot {
m T} ig]$

Open Calculator

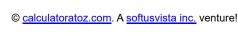
Open Calculator

$\boxed{114.3 = 3.81 \cdot 30s }$

15) Quantization Error 🗹



$$\boxed{\textbf{ex}} 0.012 = \frac{2.88}{2 \cdot 120 \text{V}}$$





16) Switching Capacity

$$\mathrm{SC} = rac{\mathrm{N} \cdot \mathrm{TC}}{2}$$

Open Calculator 🚰

 $\boxed{33.75 = \frac{15 \cdot 4.5}{2}}$

17) Time Required for Functions other than Switching

fx $T_{
m other} = T_{
m cs} - K \cdot T_{
m st}$

Open Calculator

18) Total Number of Offered Calls

 $ag{T_{
m c} = rac{N_{
m L}}{
m GoS}}$

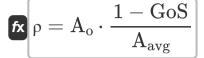
Open Calculator

19) Traffic Handling Capability

 $ext{TC} = rac{2 \cdot ext{SC}}{ ext{N}}$

Open Calculator 🚰

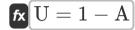
20) Trunk Occupancy



Open Calculator

 $\boxed{0.2482 = 0.85 \cdot \frac{1 - 0.27}{2.5}}$

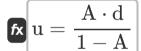
21) Unavailability of System 🗲



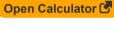
Open Calculator

 $\boxed{\textbf{ex} \left[0.3 = 1 - 0.70\right]}$

22) Uptime



$$= 15.98333 s = \frac{0.70 \cdot 6.85 s}{1 - 0.70}$$





Variables Used

- A Availability
- A_{avq} Average Occupancy
- A Occupancy
- A_n Poisson Arrival
- AHT Average Holding Time (Second)
- C Cost per Subscriber
- C_c Cost of Common Control System
- C_{ch} Cost of Common Hardware
- Cci Cost Capacity Index
- C_s Cost per Switching Element
- C_{SW} Cost of Switching System
- d Downtime (Second)
- e_q Quantization Error
- GoS Grade of Service
- K Number of Switching Stage
- n Average Number of Calls
- N Number of Subscriber Lines
- N_L Number of Lost Calls
- n_{sw} Number of Switching Element
- SC Switching Capacity
- T Time Period (Second)
- T_c Total Number of Offered Calls





- T_{cs} Call Setup Time (Second)
- Tother Time Required Other than Switching (Second)
- T_{st} Average Switching Time per Stage (Second)
- TC Traffic Handling Capacity
- **u** Uptime (Second)
- **U** Unavailability
- V Voltage (Volt)
- V_{sin} Sinusoidal Input
- A Average Poisson Call Arrival Rate
- p Trunk Occupancy



Constants, Functions, Measurements used

- Measurement: Time in Second (s)

 Time Unit Conversion
- Measurement: Electric Potential in Volt (V)

 Electric Potential Unit Conversion





Check other formula lists

- Digital Switching System Formulas
- Telecommunication Traffic
 System Formulas

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