

TELEPHONE TRAFFIC - DIAL CENTRAL
OFFICE EQUIPMENT SWITCH QUANTITIES

Purpose: This addendum replaces Addendum No. 1 dated August 1961. It changes the recommended basis of engineering toll connecting trunks from a probability of three or five delays in a hundred calls ($P = .03$ or $P = .05$) to one to three delays in a hundred calls ($P = .01 - P = .03$). It also changes the recommended basis of engineering nontoll connecting trunks from a probability of five or ten delays in a hundred calls ($P = .05$ or $P = .10$) to three to five delays in a hundred calls ($P = .03 - P = .05$). This more liberal provision of interoffice trunks is in accordance with standards being adopted by the telephone industry. Due to the adverse effect of delays on service, it is now recommended that these groups be engineered more liberally than in the past.

Changes: Following are the revised paragraphs of REA TE & CM-510 incorporating this change in the provision of toll connecting trunks:

- 3.23 The grade of service for interoffice trunks, in general, will vary from $P = .01$ to $P = .10$, depending on economic factors and the class or classes of traffic to be routed over the group. It is an observed fact that for all types of interoffice trunks the subscriber considers that the grade of service rendered should be excellent if the distance to the called office is small; on the other hand, a somewhat poorer grade of service will be tolerated when the called office is some distance away. The subscriber will become impatient more quickly with inability to get an operator, particularly on an emergency call, than with inability to get another subscriber. These and other considerations enter into determining an appropriate grade of service for interoffice trunks. The grades of service for nontoll connecting (formerly EAS and short haul toll) trunks, in general, will vary from $P = .03$ to $P = .10$, depending on the cost, classes of traffic to be routed over the group and on the type of community served by the trunk group.

3.24 For average conditions it is suggested that the following table be used to determine the number of trunks to provide:

<u>Toll</u> <u>Connecting</u>	<u>Nontoll</u> <u>Connecting</u>
P = .01 - .03	P = .03 - .05

- (1) EXCEPTIONS: Some less liberal provision of trunks may be justified for unusual situations where the community served by the trunk group is such that the peak traffic each year is of short duration. A resort or truck farming area where the marketing season is short would be examples. Also, less liberal provision of trunks would be justified where the cost of trunk facilities is excessive. Under unusual conditions a grade of service as low as .05 may be justified for toll connecting trunks and .10 for nontoll connecting trunks. The P = .03 grade of service for nontoll connecting trunks would be desirable: (1) for large trunk groups; (2) for trunk groups used in tandem; (3) for short haul toll; (4) where the distance between offices is very short (a mile or so); (5) for any cases where no significant economic penalties are incurred.
- (2) Where one or more "high usage" toll connecting groups are provided between a tributary and offices other than its regular toll center, they would, of course, be engineered on a basis of delay much greater than P = .01.

4.554 The grades of service in accordance with paragraph 3.24 are:

<u>Group</u>	<u>EAS</u>	<u>Toll</u>	<u>Grade of Service</u>
A - B	X		.05
A - D		X	.01
B - C	X		.05
B - D		X	.01
C - D		X	.01

4.555 Consider group A - B. The number of unit calls to be carried is 5.7 at $P = .05$. From Figure 2A for this grade of service:

<u>No. of Trunks</u>	<u>No. of Unit Calls</u>	<u>Unit Calls Difference</u>
1	1.9	
2	12.9	11.0

From paragraph 3.22:

$$10 \text{ percent} \times 11.0 = 1.10$$

If one trunk is to be provided, the maximum traffic which the group may carry is:

$$1.9 + 1.1 = 3.0$$

Since the number of unit calls to be provided for exceeds 3.0, the next higher trunk group is provided and, $N = 2$.

ANS. The grade of service is between .01 and .02.

4.556 In a similar manner, the number of trunks for each of the other groups is determined:

<u>Group</u>	<u>Objective (P)</u>	<u>Unit Calls (Busy Hour)</u>	<u>No. of Trunks</u>	<u>Quality of Service Better Than (P)</u>
A - D	.01	10.4	3	.01
B - C	.05	27.8	3	.05
C - D	.01	67.4	7	.01
B - D	.01	216	13	.02