FIELD OF USE OF END OFFICE INTERTOLL-TYPE HIGH USAGE GROUPS

1. GENERAL

1.01 Certain restraints must be placed on the field of use of end office intertoll-type high usage groups. The following discussion of these restraints is based on Traffic Facilities Practice, Division G, Section 2d(2), September 1968, pages 7 and 8. The transmission design objectives for high usage (HU) trunk groups are defined by Section AB21.025.

1.02 This section is being reissued to clarify the distance limitations on the use of HU trunk groups between end offices and offices of higher rank, and to incorporate minor corrections.

2. FIELD OF USE OF END OFFICE INTERTOLL-TYPE HIGH USAGE GROUPS

2.01 The expression "End Office Intertoll-Type High Usage Groups," as used in this section, refers to HU groups carrying detail billed long distance messages between end offices (class 5) in different toll center areas or between an end office in one toll center area and an office of higher rank (class 4, 3, 2, or 1) in another toll center area. The phrase is more descriptive and better suited to this exposition of basic principles than the standard nomenclature which categorizes end office toll groups by function.

2.02 Provision of intertoll-type HU groups at end offices (class 5), either one-way or two-way, is an effective way of reducing switching at higher ranking offices and of slowing down the rate of growth in metropolitan switching system requirements. However, their field of use is subject to restraints not applicable to HU groups terminated at offices of higher rank. These restraints stem from Plant and Engineering Department considerations that are important from the standpoints of service and administration.

2.03 The restraints outlined in the paragraphs which follow are fully applicable where an intertoll-type HU group extends between end offices in nonadjacent toll center areas or between an end office and a toll center in another toll center area, and where the group is designed to function as a part of the Switching Plan for Distance Dialing (SPDD). Distance is a significant factor in the application of these restraints. They have only limited application to very short-haul intertoll groups, such as between adjacent metropolitan or toll center areas, which are basically a part of a localized short-haul toll network. The degree of their application to short-haul situations can be determined only by analysis of the conditions present in each case.

2.04 Use of intertoll-type HU groups between end offices, either one-way or two-way, is feasible at this time for customer-dialed station calls where:

(a) The end offices are not more than about 200 miles apart.

(b) The offices are linked by voice-frequency facilities or by a single link of short-haul carrier (N, ON, or T1).

(c) Both offices have alternate routing capability (originating office only if group is one-way).

(d) Local AMA recording is available at the end offices (originating office only if group is one-way).

(e) The 6-digit translation ability and capacity are available in cases where the offices are in different NPAs (originating office only if group is one-way).

From the standpoint of the SPDD, these five requirements are fully met only by No. 5 crossbar and No. 1 ESS switching systems. Step-by-step and panel systems are deficient in alternate routing capabilities. No. 1 crossbar 6-digit translation arrangements involve recycling which is very limited in its field of use because of cost, and crossbar tandem systems are not

designed for end office use, except exclusively for centrex-CU.

2.05 Plant maintenance and administrative considerations significant from a service standpoint impose these additional requirements:

(a) The carrier should terminate in the same offices (or building entities) as the trunk equipment.

(b) A carrier group alarm, which performs the function of automatically releasing customers' lines and making the trunks busy when the carrier fails (not available for L-type carrier), should be provided.

(c) Each office should have standard test equipment for maintenance of the carrier.

2.06 ▶Use of intertoll-type HU trunk groups between end offices and higher ranking offices, either one-way or two-way, is feasible at this time where the offices are not more than about 200 miles apart and all requirements previously outlined are satisfied.◀

2.07 ▶HU groups over longer distances ordinarily involve mixed types of facilities (voice pairs with carrier or combinations of different carriers). However, in such cases transmission, plant maintenance, and administrative considerations, which are important from a service standpoint, impose these additional requirements:

(a) Intertoll-type trunk relay equipment should be used at the toll office together with a testboard appearance.

(b) When trunks are one-way, they should be ***to*** the end office. The testing must be done from the outgoing end, i.e., at the higher ranking office.

(c) Requirement (a) also applies to those facilities less than 200 miles in length where satisfactory maintenance or access would not otherwise be provided.

Elimination of the 200-mile limitation on the length of end office-end office or end office-higher class office group, and of the limitation on use of one-way groups from an end office to a higher class office must await availability of plant maintenance and testing equipment. This includes a remote office test line (ROTL) needed at each end office and an ROTL control needed at the toll testboard responsible for maintenance on trunks (outgoing) which terminate at an end office.◀

2.08 For end office intertoll-type HU groups of less than 200 miles in length, a minimum group size of three trunks is recommended unless there is a requirement for 6-digit translation, in which event the considerations outlined in 2.04 apply. When longer haul groups become feasible, the additional plant training, administrative effort, and testing gear make it advisable to refrain from establishing any such groups at an end office until the load is sufficient to support enough groups for a total of at least 12 trunks.

2.09 In planning intertoll-type HU groups terminating at end offices, it is imperative that day and evening calling patterns be carefully examined, both for the groups and for the originating toll center as a whole. This will avoid having HU groups at some end offices with margins at a time when similar groups at other end offices and the toll center office(s) have high occupancy. It also will avoid creating a situation wherein the total intercity facility requirements are greater than they would be if all traffic were switched at the toll center office(s).

2.10 Where it is not possible to obtain a good day-evening load balance in a day office-busy-hour city, it is preferable to have the higher day load (and unbalance) on the highest ranking office and other offices in the toll center area which have through switched loads. This provides a cushion for peak loads in the evening and on holidays when the through switched loads tend to be higher. These same considerations apply where a good day-evening load balance cannot be obtained in an evening office-busy-hour city, with the higher evening load in this instance being on the highest ranking office and on other offices in the toll center area which have through switched loads.

2.11 Even where a reasonable day-evening load balance is attained, there is no assurance it will remain that way. Such occurrences as differing rates of growth in individual offices, toll rate reductions, or changes in the effective time of reduced rate periods can quickly alter the traffic

distribution pattern. Hence, periodic reexamination of the day-evening balance is necessary.

2.12 It is apparent from the foregoing that a considerable amount of preliminary study work is required in connection with the establishment of intertoll-type HU groups at end offices. Point-to-point data indicating the traffic load is only a starting point. Feasibility considerations from both a traffic and a plant standpoint then must be fully explored for both terminals. Nevertheless, the benefits gained in terms of reduced switching justify the effort expended.