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FM 101–15

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STAFF OFFICERS' FIELD MANUAL

TRAFFIC CIRCULATION AND CONTROL

January 13, 1943

STAFF OFFICERS' FIELD MANUAL

TRAFFIC CIRCULATION AND CONTROL

CHANGES No. 1

WAR DEPARTMENT
WASHINGTON 25, D. C., 30 March 1944.

FM 101–15, 13 January 1943, is changed as follows:

■ 9. DEFINITION.—Traffic planning is the progressive and intensive adaptation of road movement to meet existing requirements, further the tactical mission, and insure the continuous movement of traffic to and from the forward areas.

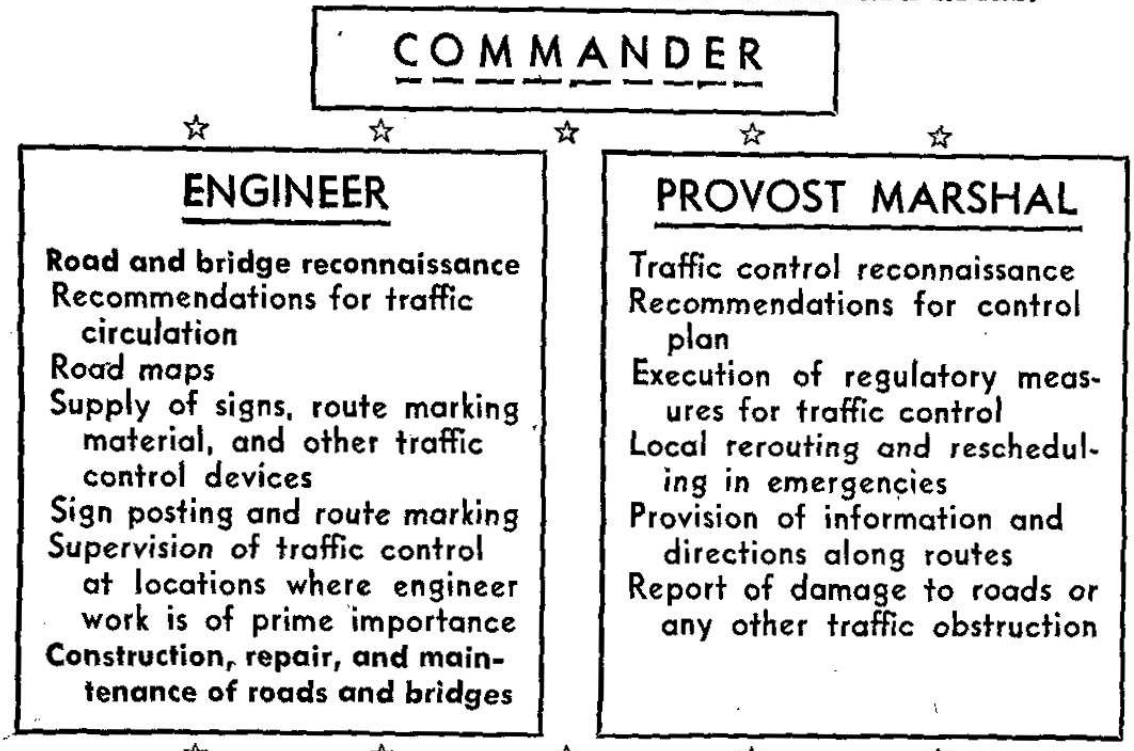


FIGURE 1.—Organization for traffic circulation and control.

* * * * *

■ 43. MAP SYMBOLS.

* * * * *

b. Road types.

Physical characteristics	Type of surface		
	All weather		*Earth*
	Paved; such as concrete, **bituminous, brick,** or other **pavement**	***Improved; such as** gravel, crushed rock, **stabilized soil, select granular material, or other wearing material**	**Unimproved;** dusty when dry, muddy when wet
Good road (gentle grades, gradual curves, smooth surface, good foundation).	A	C	E
Poor road (steep grades, sharp curves, rough surface, or poor foundation).	B	D	F (**Probably impassable in wet weather.**)

***Includes roads of these materials treated with a dust palliative or covered by a *bituminous* surface treatment of seal coat.**

■ 53. GENERAL.—Regulation as used * * * of individual columns. It includes the use of traffic control equipment. Regulation is a function of military police. However, at locations where engineer work is of prime importance, such as bridges, ferries, and approaches thereto; roads under construction; and water supply points, the work of the military police in controlling traffic is subject to such modification or restriction by the engineers as the engineer officer in charge may deem necessary.

* * * * *

■ 55. RESPONSIBILITIES.—The provost marshal is responsible for all matters pertaining to traffic regulation by military police. He makes recommendations for the traffic control plan to traffic headquarters. Responsibility for execution of the control plan is delegated as indicated in figure 1.

■ 56. AUTHORITY OF MILITARY POLICE.—In the performance of their duties military police are representatives of the headquarters which controls their area, and are not subject to orders from any lesser authority. Military police, when on traffic duty, assist the movement of columns, make local adjustments in routing and scheduling, halt columns temporarily, and enforce movement priorities in conformity with traffic plans and orders.

[A. G. 300.7 (22 Feb 44).]

BY ORDER OF THE SECRETARY OF WAR:

OFFICIAL:

J. A. ULIO,
Major General,
The Adjutant General.

G. C. MARSHALL,
Chief of Staff.

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FM 101–15

STAFF OFFICERS' FIELD MANUAL

TRAFFIC CIRCULATION AND CONTROL

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1943

WAR DEPARTMENT,
WASHINGTON, January 13, 1943.

FM 101–15, Staff Officers' Field Manual, Traffic Circulation and Control, is published for the information and guidance of all concerned.

This manual contains broad principles and techniques applicable to large-scale traffic planning, coordination, and supervision. It is issued for the guidance of staff personnel charged with traffic circulation and control in divisions and larger units. Basic techniques pertaining to individual column movements and their control are contained in FM 25–10, Motor Transport, and FM 29–5, Military Police. Logistical data are found in FM 101–10, Staff Officers' Field Manual, Organization, Technical and Logistical Data.

[A. G. 062.11 (9–7–42).]

BY ORDER OF THE SECRETARY OF WAR:

G. C. MARSHALL,
Chief of Staff.

OFFICIAL:

J. A. ULIO,
Major General,
The Adjutant General.

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(For explanation of symbols see FM 21–6.)

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STAFF OFFICERS' FIELD MANUAL

TRAFFIC CIRCULATION AND CONTROL

CHAPTER 1

GENERAL

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SECTION I

GENERAL

1. DEFINITION.—Military traffic circulation and control consists primarily of coordinating and controlling movements of vehicles, animals, foot troops, and civilian refugees over roadways and within traffic terminals in conformity with the tactical situation and military needs.

■ 2. TRAFFIC PROBLEM.—The movements of tactical units and of vehicles engaged in supply and evacuation involve use of roadways and terminal facilities under conditions subject to rapid and unpredictable changes. When the road net is extensive and traffic flow relatively light, the traffic problem is comparatively simple unless complicated by enemy activity. However, when the road net is limited or when flow is heavy, the need for coordination and supervision becomes correspondingly greater and detailed traffic plans may be necessary. This need is intensified when traffic is subject to mechanized or air attack. Under such conditions, usually it is necessary to assign priorities to movements in order of their relative importance, specify routes, schedule movements, limit traffic densities, and provide field supervision to insure that movements are executed in accordance with the requirements of the situation.

■ 3. RELATIONSHIP TO COMBAT OPERATIONS.—In combat operations, a numerically superior foe often may be out-maneuvered and defeated by a highly mobile opponent able swiftly to concentrate superior forces at a decisive point. Efficient traffic circulation and control insures that the inherent mobility of modern means of highway transport is exploited to the utmost. On the other hand, failure properly to plan and control highway traffic may result in loss of essential freedom of action, immobilize troops and supplies, and seriously jeopardize the success of combat operations.

SECTION II

ORGANIZATION AND COORDINATION

■ 4. ORGANIZATION.—Supervision and coordination of agencies concerned with traffic reconnaissance, planning, and execution are functions of the G–4 division of the general staff of each unit. In divisions and higher units, a portion of the G–4 section is organized into a *traffic headquarters.* Specific duties are assigned agencies. These duties are performed in accordance with general principles and policies approved by the unit commander. Organization for traffic circulation and control is shown in figure 1 (see par. 6*b* for regulating officer).

■ 5. TRAFFIC HEADQUARTERS.—Traffic headquarters operates under an assistant G–4 of each division and higher unit, or of each service command, port of embarkation, or similar administrative headquarters provided with a general staff. Traffic headquarters is charged with the following:

a. Receipt, correlation, and dissemination of traffic information.

b. Preparation of traffic circulation and control plans.

c. Supervision over and coordination of agencies furnishing traffic information and executing traffic plans.

d. Coordination with civilian traffic authorities.

e. Submission of traffic reports to higher and lower headquarters.

f. Supervision of driver selection and training.

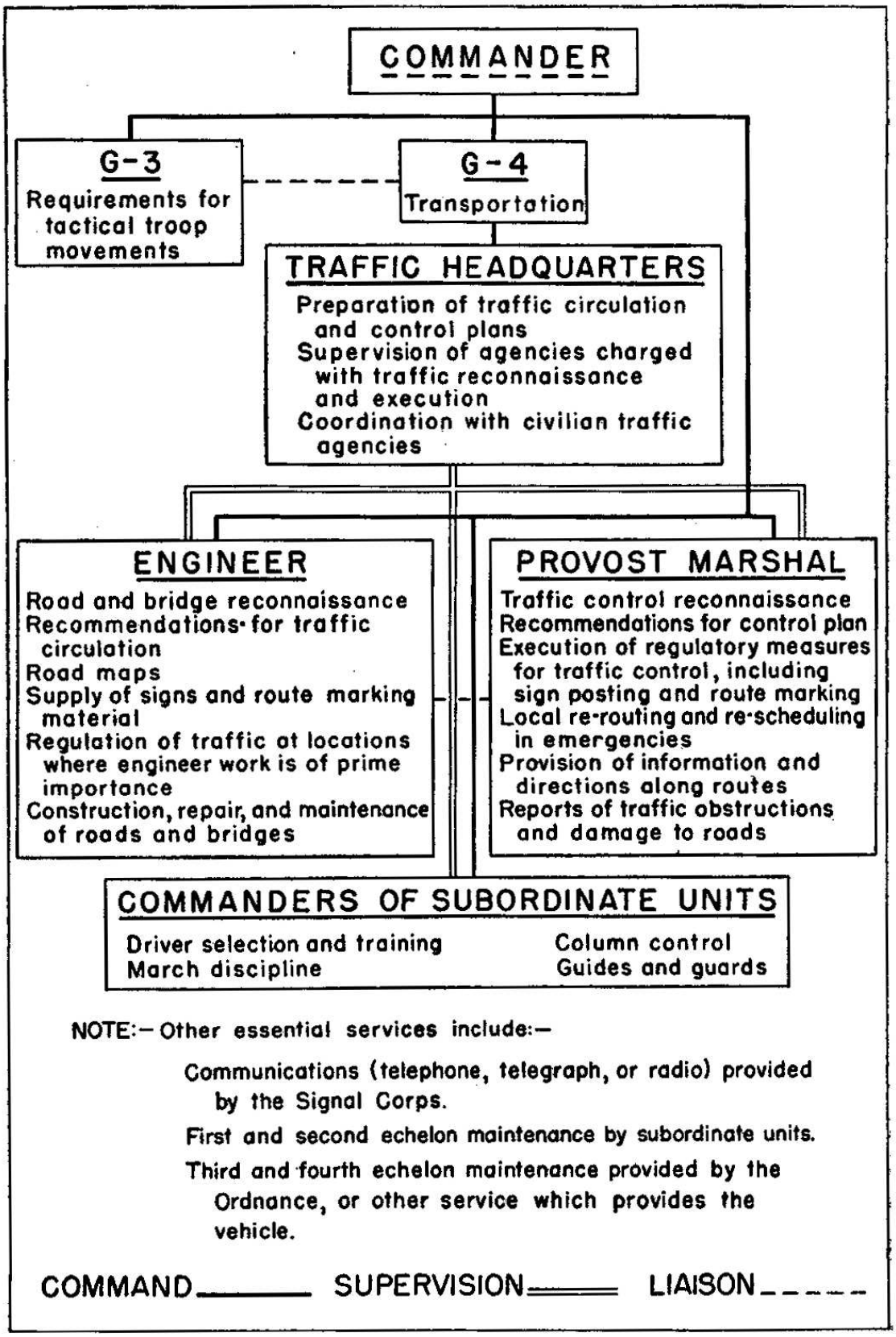


FIGURE 1.—Organization for traffic circulation and control.

■ 6. COORDINATION.—*a.* Each traffic headquarters plans traffic circulation and control within its own area in conformity with the plans of higher authority. In planning movements of troops, G–4 coordinates with G–3 on tactical plans, secrecy, and transportation requirements. Plans of subordinate units are approved by the next higher echelon of command when there is a possibility of conflict with adjacent or higher units, when the movement is part of a movement of higher echelon, or when the subordinate unit moves outside of its own area or zone of movement.

b. When the rail system is supplemented or replaced by motor transport, the regulating officer may be charged with the control of road movements in supply and evacuation between the communications zone and the combat zone. In such cases, G–4 of the theater commander's staff coordinates the traffic functions of the various traffic headquarters of the theater and those of the regulating officer.

c. In the zone of the interior, traffic headquarters establishes initial contact and arranges for any necessary coordination with civilian traffic authorities. Although local arrangements pertaining to traffic circulation and control may be worked out by agencies immediately concerned, traffic headquarters is responsible that duplicate, conflicting, or uncoordinated requests are not made to civilian traffic authorities. To effect this coordination, traffic headquarters issues such directives and requires such reports as are necessary.

■ 7. INFORMATION.—Traffic information is kept up to date and so consolidated that it is immediately available for use when needed. All agencies collecting or possessing traffic information (see ch. 2) are responsible for the prompt forwarding of this information to traffic headquarters. The collection and forwarding of traffic information in the order and form required is facilitated by use of an appropriate standing operating procedure.

■ 8. SUPERVISION.—*a.* In its exercise of staff supervision in traffic matters over agencies charged with reconnaissance and execution, traffic headquarters requires such reports and makes such inspections as may be necessary to insure efficient traffic operation. Prompt reports are required on all changes

in road net, on emergency rerouting or other divergence from approved plans, on progress of scheduled movements, and on other traffic matters as directed.

b. On receipt from the military police, engineers, or column commanders of reports concerning changes in the traffic situation or emergency measures taken in the field, traffic headquarters takes immediate steps to coordinate traffic as required by the new situation. New or amended orders are conveyed promptly to column commanders, military police, engineers, and other agencies affected by these changes.

SECTION III

PLANNING

■ 9. DEFINITION.—Traffic planning is the progressive and continuous adaptation of road movement to the changing needs of the tactical situation.

■ 10. BASIS OF TRAFFIC PLAN.—The general plan of traffic circulation and control normally is built around the system of supply and evacuation, since movements connected therewith are more readily determined and are of a recurring nature. Troop movements are superimposed on and are given preference over supply and evacuation traffic in accordance with tactical requirements. General supply principles are covered in FM 100–10 and FM 100–15.

■ 11. SPACE AND TIME.—Whenever practicable, concurrent movements are separated in space by assignment to separate, nonconflicting zones of movement, routes, or traffic lanes. Whenever the road net is inadequate or other considerations produce unavoidable route conflicts, a time apportionment of roadway use must be made, and movements must be scheduled or timed to avoid conflict.

■ 12. REQUIREMENTS OF TRAFFIC PLAN.—In order that the traffic mission may be accomplished under the changing and unpredictable conditions to which military traffic is subject, the following are fundamental requirements of traffic plans:

a. Flexibility.—Plans must be adaptable to ready modification, expansion, or alteration.

b. Simplicity.—Plans should be simple and contain no more detail than necessary.

c. Minimum restrictions.—Plans should impose only those traffic controls necessary to obtain desired results. Traffic circulation and control should never be prescribed farther to the front than required by actual needs of traffic.

d. Alternate plans.—Alternate plans, ready for execution, enhance flexibility and facilitate rapid change to meet new traffic requirements in a given tactical situation.

e. Provision for future operations.—Plans should be prepared to meet traffic requirements of probable future operations.

f. Communication.—Traffic plans must provide the signal communication system necessary for proper execution. The communication system must provide such connections between traffic headquarters and traffic control personnel and column commanders as are necessary to permit rapid transmission of orders and exchange of information (par. 60).

g. Security and secrecy.—Plans should provide for maximum protection from hostile surprise, artifice, observation, and attack.

h. Timely issuance of orders.—Sufficient time must be provided to subordinate units for reconnaissance and planning for organization of their movements in accordance with designated traffic priorities and restrictions, and for accomplishment of their assigned missions.

■ 13. PLANNING PHASES.—Although there are no definite lines of demarcation between planning phases, planning procedure may be divided into overlapping steps as follows:

a. Intelligence.—Information needed for planning includes a complete understanding as to "what" is to be moved, and "how", "when", from "where" to "where", and "why"; road and operational data; policies, priorities, and restrictions imposed by higher authority; existing traffic flow; time available for movement; tactical and protective limitations imposed by enemy capabilities; and the need for secrecy. (See ch. 2.)

b. Estimate of traffic situation.—The estimate of a particular traffic situation includes an evaluation of available

information, analysis of possible lines of opposing action, and study of the various possible means of accomplishing the traffic mission. On the basis of this estimate, a decision as to the broad basis of the traffic plan is reached. (See ch. 3.)

c. Traffic circulation.—The plan for traffic circulation will give assignment of routes, direction of movements, and reservation of or restrictions placed on certain roads. (See ch. 4.)

d. Traffic schedules.—Traffic scheduling is a means of assigning routes, making a time apportionment of roadway use, insuring traffic priorities, coordinating arrivals and departures, preventing traffic congestion, controlling average speed, and limiting average densities. (See ch. 5.)

e. Control.—Control measures are planned to facilitate traffic movement and provide regulation not exercised by the column. (See ch. 6.)

f. Protective measures.—Necessary protective measures attainable by routing, scheduling, limitations on traffic density and use of lights, secrecy, and similar means are included in traffic plans. Recommendations are made to the area commander regarding measures needed for protection of traffic within the area. (See par. 17.)

g. Classification of routes.—Routes are classified according to the degree of control exercised and restrictions imposed on their use. (See par. 58.)

h. Communication.—Communication is planned to provide coordination and control of movements and of the agencies concerned therewith. (See par. 60.)

i. Traffic orders.—The preceding phases culminate in orders which initiate traffic operations. (See ch. 8.)

j. Test of plan.—The traffic circulation and control plan should be checked to insure that it permits all traffic missions to be consummated with minimum interference between columns and with maximum security, speed, and comfort commensurate with tactical requirements.

■ 14. PLANS FOR FUTURE ACTIONS.—*a. General.*—Continuity of traffic operations is achieved by coordinating current and contemplated actions. Current operations are transitionary

and furnish a foundation for subsequent traffic activities. As a military situation may change rapidly to one requiring another course of action, broad traffic plans for possible events should be prepared in advance and kept up to date. Traffic headquarters becomes familiar with the situation in areas of lower echelons through reports and inspections of traffic circulation and control. Thus, it is prepared to route and schedule any necessary movements into or across areas occupied by lower echelons.

b. Advance or attack.—Prior to occupation of a new area by advance, attack, or landing operations, thorough preparation of provisional plans for traffic circulation and control, including engineer reconnaissance and repair work, is essential. Information pertaining to the road net may include maps, aerial photographs, and other data obtained through G–2. The plan of tactical operations and the transportation involved are studied and tentative traffic plans in conformity therewith are made ready for immediate execution. When lower echelons move forward, higher echelons must be prepared to take over their areas.

c. Defense.—Active defense calls for continual adjustment of traffic plans along lines adopted to meet the hostile attack. Particular attention is given to possible movements of our own tank destroyer units and other mobile counterattack elements.

d. Retrograde movements.—When the probable need for retrograde movement is recognized, previously prepared general plans are developed in as complete detail as time for reconnaissance, planning, and execution permits. Each echelon of command makes the general plans for movement of the next lower echelon and retains control of its own area until the lower echelon is prepared to assume control. Consideration must be given to the tactical plan, especially to location of road blocks, routes to be demolished or contaminated on inception of retrograde movement, and routes to be used for retirement. The demand which is made on the road net by heavy refugee movements and evacuation of military supplies should be anticipated and traffic control personnel reenforced by other available troops as necessary.

SECTION IV

PROTECTIVE MEASURES

■ 15. GENERAL.—*a.* The plan of traffic operations is affected vitally by protection afforded to traffic movements. Protective measures that may be provided by the manner of traffic operations are included in traffic plans. The higher commander prescribes security and secrecy measures for the protection of the command as a whole or coordinates those adopted by subordinate commanders. Each area commander adopts the measures necessary for his own local protection, including the protection of his lines of communication unless such protection is furnished by the higher commander. Each column commander is responsible for the employment of whatever means he has available to provide security and secrecy for his own command.

b. The G–2 section plans protective concealment measures pertaining to counterintelligence. The planning for and supervision of activities concerning security measures and tactical measures to preserve secrecy are functions of the G–3 section. The G–4 section, in addition to prescribing the manner of traffic movements, makes such recommendations concerning protection of the roadnet and traffic movements thereon as it deems necessary.

■ 16. COLUMN SECURITY.—For protective measures taken by commanders of individual columns, see FM 25–10.

■ 17. AREA SECURITY.—Measures which contribute to or provide security or secrecy of movement within an area may include—

a. Antiaircraft and ground protection at critical locations (such as bridges, intersections, and terminals) and on avenues favorable for hostile approach thereto.

b. Imposition of radio silence.

c. Designation of line beyond which lights are prohibited.

d. Dispersion and camouflage of terminals and installations within such establishments.

e. Camouflage of intersections. Camouflage of important intersections may be accomplished by screening and painting and by installation of decoy intersections.

f. Use of smoke. Smoke may be used to screen movements from enemy ground or aerial observers. In order not to interfere with movements so screened, care should be taken to place smoke well above or to one side of such movements.

g. Routing and scheduling—

(1) To prevent accumulation of traffic at intersections.

(2) To limit traffic density when columns are marching parallel on the same route.

(3) To avoid indicating terminals by preventing simultaneous convergence of columns and overconcentration of traffic.

(4) To obtain deception by prescribing indirect courses from origin to destination or by bypassing important intersections.

h. Use of infiltration marching (FM 25–10).

i. Employment of night marches.

j. Frequent check of control personnel and traffic aids to insure their continued functioning. Precautions are taken to insure against the subversive replacement of traffic personnel by saboteurs or the rearrangement or destruction of traffic signs, obstacle markers, and road delineators.[1] Replacements may be required after air or artillery bombardment.

■ 18. BLACKOUT MARCHES.—Night marches without lights or with the aid of blackout lights and devices, and marches during periods of mist or ground haze, provide reasonable security from enemy observation. Routes should be well marked and guides should be furnished when practicable. Measures prescribed to maintain secrecy may include—

a. Halting, or clearing of road, when flares are dropped.

b. Movement of motor and animal elements by bounds between successive areas of concealment.

c. Prohibiting smoking and lighting of matches.

d. Restrictions as to use of flashlights and other lighting equipment.

e. Suppression of talking and unnecessary noise when near the enemy.

[1] Road delineators are markers (including luminous or reflective devices and contrasting colors) placed within or immediately adjacent to the traveled portion of the roadway for the purpose of defining obstacle limits, traffic lanes, and roadway alinement.

CHAPTER 2

INTELLIGENCE

■ 19. GENERAL.—Information concerning traffic requirements, facilities available, and conditions affecting operations is evaluated, correlated, and interpreted to produce traffic intelligence. Basic data outlined in this chapter are obtained through liaison channels and from reports, situation maps, orders, and field reconnaissance. Usual sources of traffic intelligence are shown schematically in figure 2.

■ 20. DATA ON UNITS.—*a.* Up-to-date information pertaining to each unit of the command should be readily available at all times. These data comprise such items as organization, strength, amount and type of organic transport (including animals and animal-drawn vehicles), normal method of movement (whether foot, motorized, or by shuttling), normal needs for additional transport, standing operating procedure, road space and time-length of normal march units, average rate and length of marches, and similar data bearing on march capabilities of the unit.

b. By means of periodic reports, traffic headquarters is kept informed on available motor transport, whether organic, in quartermaster units, or in pools. (See Form 18, G–4 Periodic Report, FM 101–5.)

■ 21. VEHICLE CHARACTERISTICS.—The characteristics of vehicles must be considered so far as they influence traffic operations. Thus, in the selection of routes, consideration must be given to such vehicle characteristics as weight, length, width, height, turning radius, fording and hill-climbing ability, and capacity for carrying troops or supplies. Vehicular speeds and range without refueling are considerations in locating automotive supply installations and determining length of marches. Adjustments to carburetor, cooling system, or other equipment, and use of auxiliary equipment may be necessary for operation at high altitudes or under extreme conditions of cold, heat, or moisture. Cross-country ability, armor, speed, range, and special equipment may be considerations in the selection of vehicles for special tasks.

■ 22. CHARACTERISTICS OF MOTOR COLUMNS.—The limitations of individual vehicles determine the mechanical and physical limitations of the column. Hence, march units should be composed of vehicles having similar road performance characteristics. Vehicle capabilities, driver training, march discipline, character of road, conditions of operation, and column control normally determine performance of columns. Road space, time-length, and traffic flow are dependent on speed and type of movement. For characteristics of infiltration and open and close column marching, see FM 25–10.

■ 23. CHARACTERISTICS OF FOOT AND ANIMAL COLUMNS.—Characteristics of foot and animal columns that may be important in assigning routes and schedules are:

a. Fatigue.—To minimize fatigue, routes assigned foot and animal columns should be as direct as practicable. Foot troops may disregard direction of movement prescribed for vehicular traffic unless traffic flow is very heavy and the roadway inadequate.

b. Slow rates of march.—For rates of march of foot and animal columns, see FM 101–10. Due to speed differentials, conflicts will occur when motor and foot columns use the same roadway. Wherever practicable, therefore, separate routes are used for the different types of traffic. If separate routes are not available, conflict is avoided by scheduling, by having columns move to one side and halt while overtaking column passes, or by having foot columns march on side(s) of road thereby leaving major portion of roads free for passage of higher speed traffic.

c. Cross-country ability.—The cross-country ability of foot and animal columns permits these columns to utilize routes that are impassable by motor. Before assigning such routes, the degree of fatigue resulting from their use should be considered.

■ 24. INFORMATION FROM OTHER HEADQUARTERS.—*a. General plans and policies.*—Information relating to general traffic plans and policies and to restrictions and limitations imposed by higher authority is obtained from current orders and standing operating procedure (ch. 8). Items thus established may include designation of area under unit controls, reserva-

tion or other classification of certain routes, special priorities, location of certain supply and evacuation installations, and designation of the light line and of the line beyond which nontactical movements are not permitted. In addition, liaison must be effected to provide coordination during changing situation. New orders and tactical plans must be analyzed to determine their effect on traffic plans.

b. Adjacent headquarters.—Pertinent traffic information from adjacent units can be obtained through normal liaison channels. Except when higher headquarters effects necessary coordination, information is required in connection with any interchange of traffic between areas or use of common routes.

c. Lower headquarters.—Information used by lower headquarters in preparing traffic plans will prove of value to higher units as they move forward to take over the same area, or whenever they route columns through areas normally under control of the lower echelon.

■ 25. TACTICAL SITUATION AND MISSION.—*a. General.*—Information of the tactical situation and tactical plans is necessary for guidance in formulating traffic plans. Particular attention is devoted to those tactical aspects that have a direct bearing on traffic operations. Consideration must also be given to probable future action in order to insure that traffic plans are made comprehensive and adaptable to changing situations.

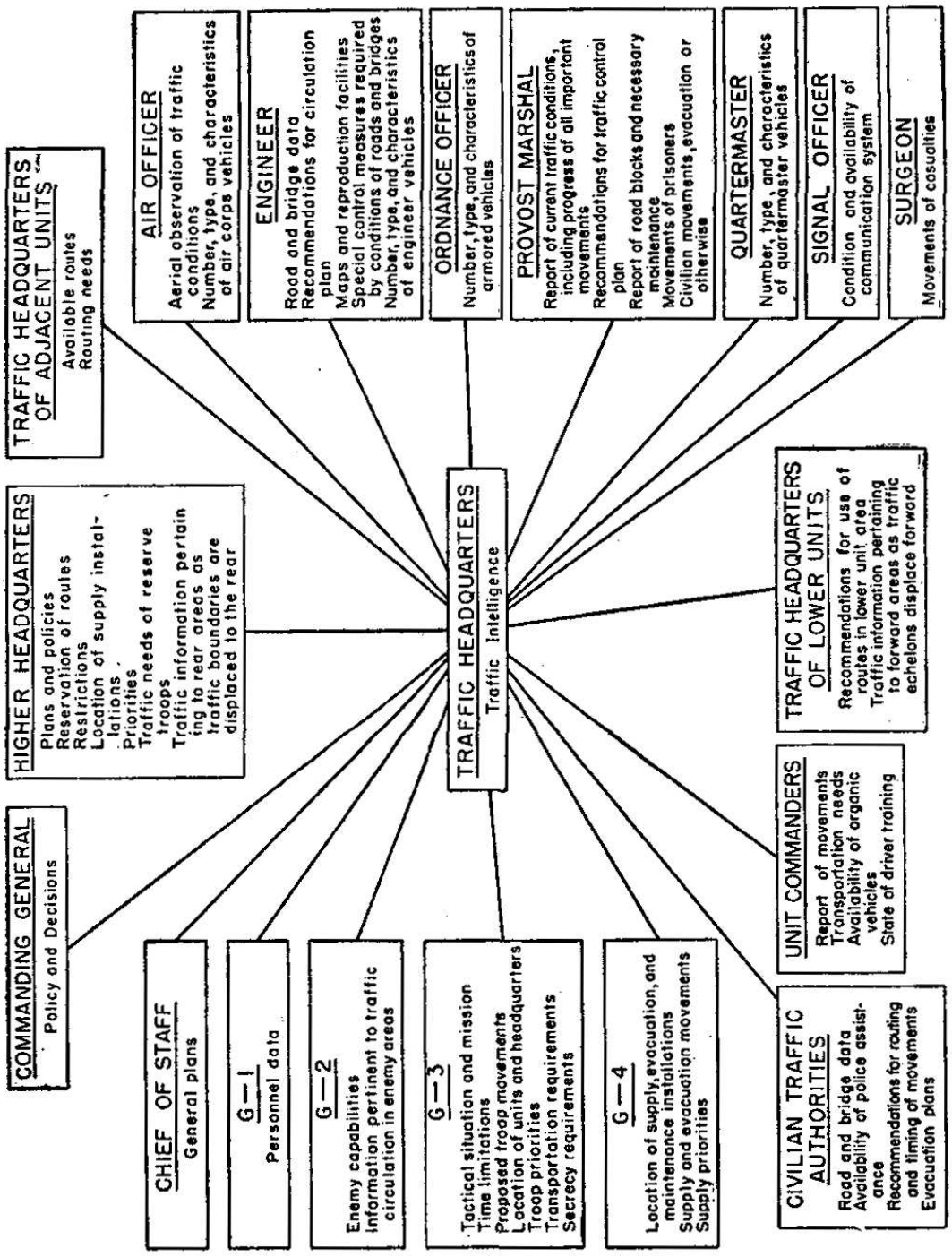


FIGURE 2.—Sources of traffic intelligence (channels not shown).

b. Troop movements.—Information necessary in planning troop movements includes size, location, and destination(s) of units involved. Priorities, desired time(s) of arrival, and other planning data will be indicated by the G–3 section of the staff. As part of the traffic information map, traffic headquarters will keep a continuous record of the location of all major units. Traffic headquarters may require that all units which move within the area under their jurisdiction keep them informed as to time of proposed movements, developments during movements, and all changes in schedule or routing. Routine movements or movements involving only a small number of vehicles may be omitted from such reports.

c. Supply and evacuation.—The volume of traffic required to haul ammunition, gasoline, and other supplies; the number of casualties and prisoners to be evacuated; and the displacement of evacuation installations will depend on the intensity and progress of combat action.

d. Time.—The basic time limitation for all major movements is that command decision which states the hour at which the attack, embarkation, concentration, or other action will take place. Knowing this, the available time must be allocated as required, to reconnaissance, planning, issuance of orders, coordination between units, preparation of units for movement, and execution of movements. Background information needed in connection with allotment of time includes knowledge of time required for each of the foregoing activities, time-length of units, and time-distance of routes to be covered.

e. Enemy capabilities.—The presence, absence, or probability of enemy activities (particularly air, mechanized, or guerilla activities) will influence selection of routes, times of movements, control measures, active and passive defense measures, type of march, and location of terminals.

f. Priorities.—General priorities may be listed in standing operating procedure. Specific priorities for a given move, or reservation of routes for special movements, will be designated as required by tactical and administrative plans.

■ 26. RECONNAISSANCE.—*a. General.*—Since time available for reconnaissance usually is limited, priority must be given

to collection of essential information. This information must be accurate and kept up to date.

b. Road and bridge data.—Much valuable road and bridge information is obtainable from studies of maps and aerial photographs, from civilian authorities, and from organizations which have operated previously in an area; but such information must be verified and brought up to date through field reconnaissance. The following data may be supplied by engineer reconnaissance units:

(1) Map or sketch of road net, including detours and alternate routes available.

(2) Physical characteristics of roads, including type of surface, condition, and road width or number of lanes (see par. 44).

(3) Location, type, and characteristics of limiting roadway features and appurtenances (such as bridges, underpasses, steep grades, one-way defiles). Items applicable thereto may include load-carrying capacity, width, condition of approaches, vertical clearance, limitations on speed and intervehicular spacings, and effect of possible demolitions.

(4) Mileage and time-distance between important road intersections.

(5) Location and character of road blocks, such as demolished bridges, mine fields, and road craters. (This information should be reported immediately upon discovery by any unit.)

(6) Progress of road and bridge repair and construction.

(7) Location and characteristics of facilities for turning, parking, and halting, with special attention to defiladed or forest-covered stretches which offer protection from enemy observation or fire.

(8) Sites, approaches, and conditions of possible crossings other than existing bridges (such as fords, ferries, potential bridge sites).

(9) Sections of important roads where engineer assistance is or may be required because of difficult operating conditions, and the amount and availability of such assistance.

c. Control requirements.—Military police obtain information concerning—

(1) Organization of area for control purposes.

(2) Requirements for traffic control posts and patrols, including location and number of personnel.

(3) Requirements for traffic aids, such as signs and road delineators.

(4) Control classification of routes.

(5) Control techniques to be employed.

(6) Communication requirements.

(7) Existing traffic flow.

■ 27. TERMINALS.—For details concerning the location, lay-out, and operation of terminals, see chapter 7.

a. Supply installations.—To correlate traffic movements to, within, and from a supply terminal, the following information may be required:

(1) Type of installation (such as railhead, water supply point).

(2) Class and amount of supplies handled.

(3) Units to be served.

(4) Exact location.

(5) Lay-out of road net, including parking space and turnarounds.

(6) Capacity for loading and unloading vehicles.

(7) Time of opening and closing, and normal hours of operation, including schedules for various units served.

b. Bivouac areas, camp sites, and other troop installations.—In planning for the traffic control requirements of an area to be occupied by troops, information of value will include exact location, road net around and within the area, subareas assigned to units, and location of nearby supply installations. Plans for subsequent circulation and control will be based on this same information, supplemented by observation of current traffic conditions.

■ 28. CIVILIAN COORDINATION.—Much valuable traffic information can be obtained from civilian authorities. Coordination of military and civilian movements, including civilian evacuation procedure, is discussed in chapter 9.

■ 29. RECORDING OF INFORMATION.—*a.* Most traffic information is readily portrayed on a large-scale map of the area concerned. Road and bridge data are applied directly by use of symbols (see par. 43). The map is then covered with

a transparent sheet, if such is available. Pins or other suitable means are used to show locations of traffic posts, terminals, command posts, other pertinent establishments, and troop units. Control area boundaries, plan of circulation, progress of movements, and changes in routing may be superimposed by use of erasable crayon. Upon completion of a movement, the crayon line is erased and subsequent movements shown. Changes in road and bridge conditions are likewise indicated by use of erasable crayon.

b. Records of contemplated and completed movements may be kept in reference file until they have served their purpose. A file containing pertinent traffic orders should also be available.

CHAPTER 3

ESTIMATE OF THE SITUATION

■ 30. GENERAL.—The estimate of the traffic situation involves a consideration of broad aspects of the problem of circulation and control and results in a decision as to a general outline of traffic operations. This estimate requires a basic knowledge of all factors influencing military traffic, familiarity with the most recent information pertaining to the problem at hand, continual alertness to present and probable traffic requirements, and an appreciation of effects that will result from decisions made. The estimate may be made an orderly process by giving consideration in turn to the following:

a. Traffic mission.

b. Facilities available and limitations under which mission must be accomplished.

c. Analysis of possible lines of action.

d. Decision.

■ 31. TRAFFIC MISSION.—The general traffic mission is to provide for expeditious and uninterrupted movement of troops and supplies, and orderly and efficient evacuation of casualties, prisoners, refugees, and matériel, in conformity with tactical and administrative plans. Specific missions may be assigned by higher authority or determined by special tactical needs.

■ 32. FACILITIES AND LIMITATIONS.—The quantity, type, limiting characteristics, and condition of available facilities and equipment, and the tactical limitations under which the mission must be accomplished are conveniently considered under the following headings:

a. Tactical situation; plans of own, higher, and adjacent headquarters.

b. Enemy capabilities, as they affect routing, scheduling, permissible traffic densities, formation and composition of columns, blackout operations, use of signal communication, and active protective measures.

c. Available facilities and equipment:

(1) Road net, including bridges and stream crossings.

(2) Vehicles or other forms of highway transportation.
(3) Communication facilities.
(4) Traffic control equipment.
(5) Automotive supplies and repair facilities.
d. Number, training, and condition of traffic personnel.
e. Present and probable traffic conditions.
f. Weather conditions.
g. Time available.

■ 33. ANALYSIS.—Consideration of all factors involved and study of available facts of the situation and their probable effect on traffic operations will reveal possible lines of action which favor fulfillment of the traffic mission. Further analysis must be made of each favorable line of action in light of enemy capabilities to hinder accomplishment of the traffic mission. The following steps will aid in analyzing possible lines of action. These steps may be abbreviated in simple situations or when time does not permit a deliberate consideration of each step in turn. Continuous attention is given to future traffic requirements.

a. Space control.—The need for and extent of space control is determined as indicated in chapter 4. Tentative plans for general circulation, reservation of routes, and routing of important movements are considered.

b. Time control.—Determination of the need for time control or scheduling is discussed in chapter 5. For purposes of analysis, usually it is sufficient to determine only if schedules are needed and can be applied within limitations imposed by the traffic mission.

c. Protective measures.—Enemy capabilities within the areas involved will determine type and amount of protective measures necessary. Consideration of type of enemy activity (such as air, mechanized, or guerilla), as well as the extent of this activity, is important. Need for passive protection must be weighed against urgency of accomplishing movements, availability of active protection, and effect upon routes and schedules. (See ch. 1.)

d. Regulation.—Details of regulations as regards routing and scheduling will have been determined in the preceding steps. Methods, means, and organization employed to super-

vise execution are indicated in chapter 6. For purposes of evaluation, it is necessary to determine only if efficient regulation can be obtained with the personnel and facilities available.

■ 34. DECISION.—The decision as to the general traffic plan results from integration and correlation of steps described in preceding paragraphs. Details are worked out after the basic decision has been made. Time available for detailed planning, transmission of plan to those involved, and execution of movements usually can be determined from the basic plan. When time is limited, warning and fragmentary orders (ch. 8) should be issued as soon as practicable.

CHAPTER 4

CIRCULATION AND ROUTING

■ 35. GENERAL.—The traffic circulation plan serves as a basis for routing all classes of movements over an area road net in accordance with tactical and administrative requirements and traffic and load capacities of roads and bridges. The plan is formulated primarily to provide for the expeditious movement of vehicles involved in routine supply and evacuation and to insure that such movements do not interfere with essential tactical traffic. Provisions are made in the circulation plan for tactical traffic so far as it can be foreseen.

a. Tactical movements.—Traffic requirements of combat troops must be given priority; therefore, the probability of combat movements and their effect upon routine movements must be considered. This applies generally to all troop movements, but more particularly to movements of special tactical units such as tank destroyer units, armored units, troops assigned to combat hostile parachutists, and other reserve units. The tactical situation may demand that these troops be rushed immediately to any one of several probable locations to meet an enemy attack or to participate in a planned attack by friendly forces. Routes contemplated for use by such units should be reserved if alternate routes for other movements are available. Otherwise, such routes should be operated as dispatch routes (par. 58) and routine traffic thereon limited at all times, so far as practicable, to afford greatest possible freedom to tactical movements. When an attack, either by the enemy or by our own forces, is imminent, nontactical traffic on all roads is held to the minimum commensurate with immediate needs.

b. Supply and evacuation movements.—The large number of vehicles engaged in routine supply and evacuation, including movements of lower units engaged in local supply activities (such as water supply), must have ready access to all terminals involved. The circulation plan, therefore, must provide for the expeditious movement of this traffic from origin(s) to destination(s) and return. In the event that certain routes are needed for tactical movements, provisions

should be made to accommodate supply and evacuation movements on remaining routes.

c. Miscellaneous movements.—Miscellaneous movements include movements of engineer, signal, and military police vehicles performing their respective repair, maintenance, and patrol functions; movements of special service and supply vehicles (for example, Army Air Forces, Chemical Warfare Service, Ordnance); movements of individual vehicles such as staff cars and messenger vehicles; other sporadic military traffic; and essential civilian traffic. So far as practicable, the circulation plan should permit the movement of such traffic and not require it to use circuitous routes unnecessarily. Vehicles such as command, reconnaissance, communication, maintenance, and repair on a definite mission may be permitted to move contrary to prescribed direction of movement on one-way roads provided they yield the right-of-way to traffic moving in the proper direction.

■ 36. BASIC REQUIREMENTS.—The general characteristics required of plans for traffic circulation and control are indicated in chapter 1, section III. The traffic circulation plan should be the simplest which will serve the requirements of the situation. Unnecessary regulations or restrictions on use of roads are avoided. Thus, circulation rarely is prescribed forward of the artillery position areas, since heavy and continuous traffic is not expected beyond these points. Similarly, when the road net is extensive and traffic is light, the only restrictions ordinarily imposed are to insure that roads and bridges having low weight carrying ability or limited clearances are not used by vehicles exceeding such limitations. Since enemy activities or weather conditions may temporarily limit the use of any road and the tactical situation may demand unforeseen troop movements, flexibility is an inherent requirement. The prescribed traffic circulation plan should allow the selection of alternative routes which are readily reached from normal routes. Likewise, traffic should be so routed that it is enabled to detour quickly to other roads or to clear the route for passage of special movements. Probable destruction or impairment of important structures of the road net is anticipated, and steps are taken to provide facilities for emergency use.

■ 37. ENGINEER SERVICES.—Excessive speeds, overloading of roads and bridges, heavy and continuous traffic on roads with poor surface or subgrade, and use of roads in need of repair will cause roads and bridges to deteriorate rapidly. Recommendations for the protection of the road net from such abuse are submitted by the unit engineer as a result of his reconnaissance (par. 26*b*). These recommendations must be given careful consideration in formulating the circulation plan and routing traffic. Consideration is likewise given to probable need for essential engineer construction work and assistance to vehicles in negotiating important roads and stream crossings under adverse conditions. Requests for engineer assistance are kept to the minimum consistent with proper accomplishment of the traffic mission.

■ 38. TRAFFIC CAPACITY AND FLOW.—*a. Traffic capacity.*—Traffic capacity is an inherent quality of a roadway and can be increased only by the improvement of facilities afforded for movement. The traffic capacity of a route or system of highways can be defined as the maximum traffic volume which can be accommodated in vehicles per unit of time. It is dependent on—

(1) Allowable speed.

(2) Available lanes.

(3) Permissible density (vehicles per unit of distance).

Allowable speed depends upon road conditions, such as width of lanes and shoulders, type and condition of surface, curvature, and gradient, and also on the tactical situation.

b. Traffic flow.—Traffic flow is defined as the number of vehicles which pass a given point in a given period of time (for example, 500 vehicles per hour). Flow attainable is limited to the capacity of the worst traffic bottleneck encountered and is dependent on factors which affect vehicular speed and traffic density. (For traffic flow data, see FM 25–10.)

c. Computations in planning.—Traffic flow estimates are based on consideration of the number of personnel and amount of supplies and material to be moved; the amount, capacity, type, and use of highway transportation available; conditions influencing vehicular speeds and traffic densities;

and time available for movements. In estimating traffic flow, allowance must be made for miscellaneous movements (par. 35*c*) unless such movements are denied access to routes contemplated. This estimated traffic flow is then allocated to as many of the available routes as are necessary to accommodate it within the time available without exceeding permissible traffic densities.

■ 39. MAIN SUPPLY ROAD (M. S. R.).—*a. Purpose.*—Keeping all roads open at all times may be impractical or physically impossible because of the amount of engineer work entailed in such an undertaking. Since it is desirable that at least one axial route be kept open for each division, one road, known as the main supply road, ordinarily is designated as the route to be kept open. Engineer units have the mission of performing such maintenance and repair functions and furnishing such assistance to vehicles as are necessary to keep traffic moving on main supply roads, regardless of weather, enemy activity, or other difficulties.

b. Designation.—General considerations in designating routes are given in paragraph 42. Main supply roads, when designated, should give easy access to the greatest number of terminals. In selecting main supply roads, consideration should be given to those roads which are least subject to deterioration by bad weather or heavy traffic and which provide continuous routes throughout army, corps, and division service areas. Engineer considerations are contained in paragraph 37. Roads which provide natural cover and defilade from enemy observation and fire are selected, provided other conditions are met.

c. Use.—The main supply road is not intended to be the road by which all supply and evacuation must move. On the contrary, traffic normally is dispersed over all roads not reserved for some other specific purpose, and is routed as indicated in paragraph 44. Overconcentration of traffic on the main supply road must be avoided, and rigid control is exercised to regulate all traffic thereon during critical periods when other roads are not available.

■ 40. ONE-WAY ROADS.—*a. General.*—Ordinarily, multiple-lane roads are operated as two-way roads unless one-way

traffic is absolutely necessary. One-way routing is not prescribed without careful study as to its full effect on traffic, both on the roadway concerned and on the road net as a whole. Thus, care is exercised to insure that access to or egress from any installation is not denied to traffic, that time-distances [1] between important terminals are not unduly increased, that vehicles are not forced to use hazardous roads unnecessarily, and that long back-hauls are not required. Ordinarily, one-way routes are designated in pairs so that traffic in both directions is accommodated. The use of a one-lane road alternately in opposite directions ordinarily involves excessive traffic delays with halts on the approaches thereto and requires a well-organized control system which may include posting of control personnel, installation of control devices and communication facilities, and scheduling the use of the one-way section. Therefore, such operation is avoided unless absolutely necessary because of unavailability of other routes or the greater time consumed in use of circuitous routes. Whenever the need for one-way routing ceases, restrictions on direction of movements are withdrawn promptly and one-way signs removed.

b. When warranted.—One-way movement may be prescribed under the following conditions:

(1) On one-lane roadways. (A one-lane road, if used, must be operated as a one-way road either permanently in one direction or alternately in opposite directions.)

(2) On multiple-lane roadways when the full traffic capacity of the roadway is desired for movement in a single direction.

(3) When traffic flow can be facilitated by reducing the number of conflicting traffic streams.

(4) When it is essential to simplify traffic control at heavily traveled or complex intersections.

(5) When two parallel roads form a loop that permits traffic to move to its terminal by one road and return by the other.

c. Blackout operations.—One-way routing is especially advantageous in minimizing traffic accidents and conflicts

[1] Time-distance is the time required to move from one point to another at a given rate of speed.

and preventing congestion during blackout operations. Even under blackout conditions, however, the factors stated in *a* above must be given due consideration before one-way operation is prescribed.

■ 41. ENFORCEMENT.—Restrictions on use or roads require personnel and control facilities for enforcement. An important consideration in formulating the circulation plan is the feasibility of necessary control by military police, taking into account their personnel and equipment available and the enforcability of contemplated restrictions. For example, a one-lane defile may require no regulation if it is a part of a one-way road, but the same defile will require personnel to regulate traffic if it is a part of a two-way road.

■ 42. PREPARATION OF CIRCULATION PLAN.—Preparation of the traffic circulation plan consists of assimilating all available pertinent information and prescribing the use of all important roads in the road net. The following specific steps are involved in preparing this plan:

a. Indicate restrictions imposed by own or higher headquarters.—Any roads, within own or lower unit areas, which are reserved or otherwise restricted by own or higher headquarters must be indicated by the circulation plan.

b. Indicate restrictions imposed by physical characteristics of roads.—Widths, clearance heights, and load capacities of critical structures, number of traffic lanes, and type and condition of surface must be indicated in the circulation plan to prevent the use of roads by traffic which they cannot accommodate.

c. Indicate locations of terminals.—The location and classification of supply, evacuation, and administrative establishments in the area should be indicated in the circulation plan. For influence of road net on location of terminals see paragraph 64.

d. Indicate routes and direction of movement thereon.—Movement of traffic may be facilitated by organizing the road net into a system of routes and prescribing permissible direction(s) of movement on all portions thereof. Routes in

each area should tie in with routes established in other areas by higher, lower, and adjacent headquarters. The designation of each route, and, whenever possible, the prescribed direction(s) of movement thereon, should be consistent throughout all areas through which the route passes. In prescribing direction of traffic movement, attention should be given to considerations affecting one-way operation (par. 40). If one-way routing is used, care must be taken to insure that movement to the front, from the front, and in both directions parallel to the front is possible. In establishing routes in forward areas, attention should be given to avoiding roads or intersections known to be under enemy fire. Cities which have not been evacuated and other congested areas should be bypassed whenever possible. In friendly territory, the aid of civilian authorities will be helpful in drawing up detailed plans for routing traffic through cities which cannot be bypassed.

e. Roads crossing boundaries of area.—When roads cross into adjacent areas, agreement must be reached with adjacent headquarters concerning traffic regulation, unless higher headquarters has already prescribed these details. The road net for each subordinate unit generally is confined to the limits of the tactical area assigned to such unit. However, in cases where communication of any lower unit with rear area installations is dependent upon the use of a road or roads passing through the tactical area of an adjacent unit, or in the case where a road lies on the boundary between two units, regulations governing the use of these roads by the adjacent lower units is prescribed by the higher headquarters.

f. Circulation map.—The circulation plan, issued as an annex to the administrative order, normally is shown either on a map or on an overlay. On this map or overlay are shown the road net with pertinent, up-to-date road data, the location and classification of important terminals, and the prescribed circulation on roads. Control classification of roads also may be shown. A typical circulation map for a division defending a river line in an area having an exceptionally good road net is shown in figure 3. Symbols used are ex-

plained in paragraph 43. Additional information, such as road types, number of traffic lanes, average time-distance or distance in miles, and other data useful in planning, if considered necessary, may be shown by appropriate symbols as given in paragraph 43.

■ 43. MAP SYMBOLS.—*a. General.*—Symbols listed in this paragraph may be used to present traffic information and indicate the traffic circulation plan in convenient and concise form. Road information shown on a map applies throughout the length of road between points shown by heavy dots or cross bars.

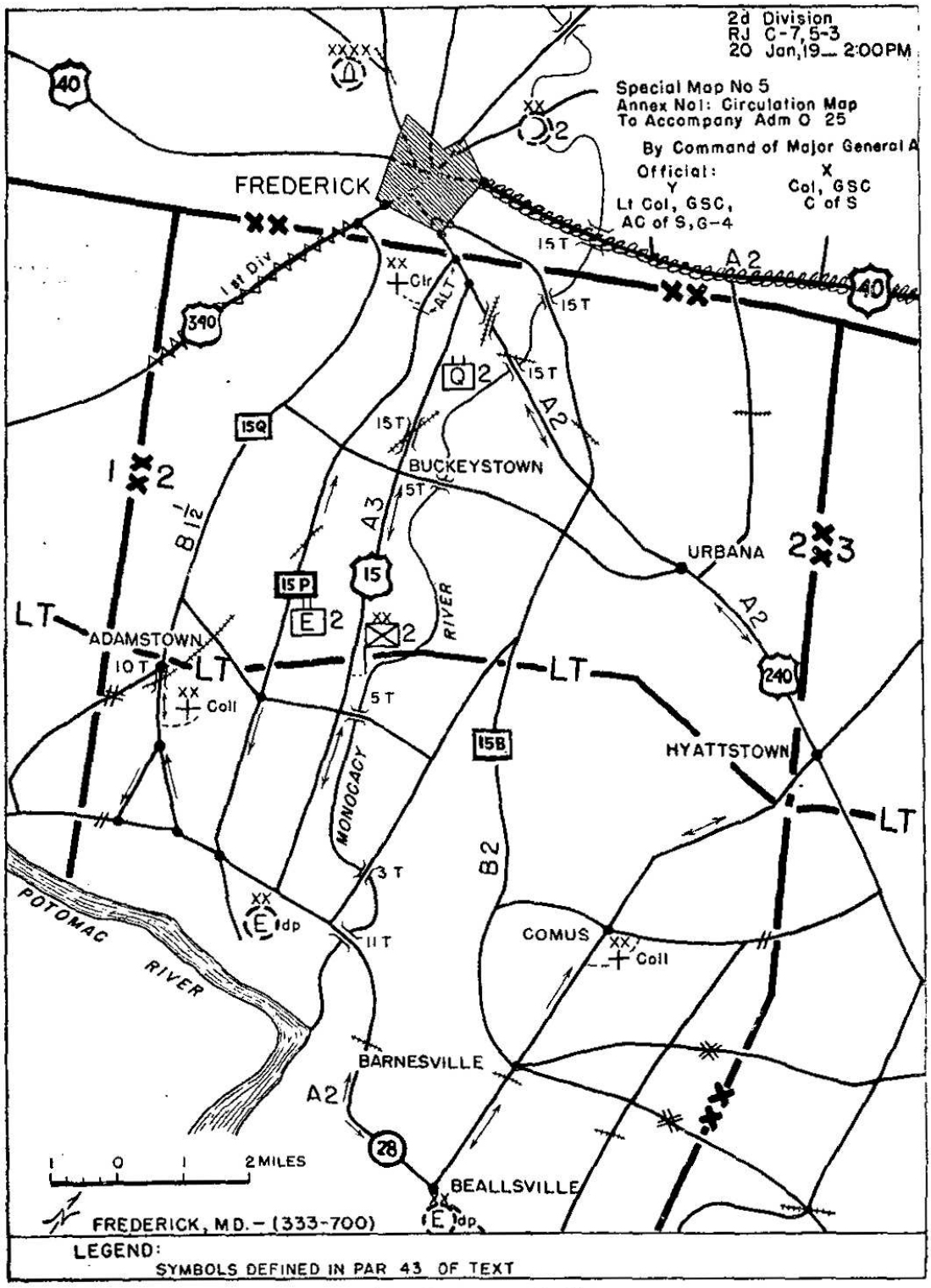


FIGURE 3.—Traffic circulation map.

CHAPTER 5

SCHEDULES

■ 46. USES.—Traffic schedules are employed to provide coordination of highway movements in time and space. Normally, however, they should not be used when desired coordination can be more readily obtained by other means, such as by assignment of independent routes or zones of movement. Specific uses are as follows:

a. To provide time coordination of arrivals and departures of columns and vehicles at origins, destinations, and intermediate locations in accordance with administrative and tactical needs.

b. To provide for uninterrupted movement of traffic by preventing meeting of columns at locations without adequate facilities for their simultaneous accommodation.

c. To provide for movement of traffic in accordance with priorities by prescribing periods during which specific facilities are reserved for designated movements.

d. To minimize delays, conflicts, congestion, and their attendant evils by insuring that traffic flow never exceeds the capacity of the worst traffic bottleneck to be encountered, and by spreading peak traffic flow over longer time intervals.

e. To provide detailed regulation of individual movement.

f. To obtain secrecy and passive protection by prescribing movements during darkness.

g. To limit traffic densities to those prescribed by coordinating simultaneous movement of two or more columns over the same sector of roadway.

■ 47. TYPES.—*a. Infiltration.*—An infiltration schedule is the vehicular dispatch rate assigned to a unit for use during a specified period. Vehicles dispatched proceed independently to their destination over a prescribed route. By assigning appropriate dispatch rates to different units using the same route, it is possible to insure that average traffic flow (or density), particularly at the worst traffic bottleneck, is held within desired limits.

(1) *Example.*—Several units must use a certain route on which average traffic flow must be restricted to 200 vehicles

per hour in order not to exceed desired traffic density at the worst bottleneck. This is accomplished by dividing the dispatch rate of 200 vehicles per hour among units concerned in proportion to number of vehicles to be moved and urgency of their respective missions. Other traffic must be kept off the route or allowance made for existing traffic flow.

(2) *Caution.*—This type of schedule is not applicable to moves where immediate organized action against the enemy may be required. When applied to other moves, it requires that routes be well marked and individual drivers be thoroughly instructed.

b. Location.—A location schedule apportions time to different movements at an individual location, such as an initial point of march, an intersection or other traffic bottleneck, or terminal.

c. Column (including shuttling).—A column schedule designates the arrival (clearance) times for an individual movement at specific control points along a prescribed route of march.

d. Route.—A route schedule apportions time to different movements proceeding along or intersecting a given route. Route schedules are used principally on dispatch routes (par. 58).

e. System.—A system schedule is the composite schedule for time control of all important movements on a given road net.

■ 48. NEED.—The need for time coordination in accomplishment of tactical, administrative, or traffic objectives usually is indicated in pertinent movement orders. Further need for schedules may be determined by analyzing locations where traffic streams cross or converge (such as intersections and defiles). Potential conflict at such locations is revealed if movements expected for each day (or other appropriate interval of time) are plotted graphically on a "traffic map" in the manner described in paragraph 29. Ordinarily, location schedules are not required when columns do not exceed a time-length[1] of 3 to 5 minutes, as conflicts can be solved in the field.

[1] Time-length is defined as time required for a column or element thereof to pass a given point.

■ 49. PROCEDURE.—*a.* In general, movements should be so scheduled that each individual unit can perform its mission without traffic conflict. Since this cannot always be done, however, special consideration is given to high priority traffic. The procedure under these circumstances is to prepare a schedule for movement having highest priority, follow with schedules for other movements in order of priority, and correlate conflicting requirements by rerouting or by giving preference where necessary to these movements having higher priorities.

b. The location offering the most difficulty or requiring greatest attention is selected as the starting point for coordination of various movements. Schedules for various locations, columns, routes, and the system are then worked out. This procedure must be modified, when necessary, to insure that low priority movements are not prohibited from using roads for extended periods of time; and provision should be made for routine traffic to infiltrate between scheduled units.

■ 50. PRIORITY.—*Designation of traffic priority is a command function* and is based on tactical, administrative, and traffic considerations. Comparative urgency of conflicting movements is used as a basis for determining priority. As a rule, however, requirements of combat troops are given first consideration. Within combat units, preference may be extended to and separate routes reserved for armored units, tank destroyer units, and troops to combat hostile parachute troops. Antiaircraft units may also take precedence on occasion. Under certain conditions, special consideration may be given to supply movements, ambulances, Signal Corps trucks, and trucks loaded with road and bridge material. In the advance, forward movements normally have precedence over other movements. Loaded vehicles usually have priority over empty vehicles. Isolated vehicles of troop commanders, staff officers, and messengers are allowed freedom of movement whenever possible.

■ 51. TIMING OF MOVEMENTS.—*a. Minimum restrictions.*—Time limitations are kept to the minimum necessary to accomplish the purpose for which a schedule is used. More

detailed limitations require undue time, effort, and energy on the part of all concerned. Thus in some instances, the designation of day or hour of departure from, clearance of, or arrival at, a single critical location often may be all that is required.

b. Flexibility.—Ordinarily, necessary flexibility in schedules is obtained by allowing a factor of safety in computing time-length, road space, and rates of march. This factor of safety is increased in proportion to the size of the unit being moved, amount of other traffic likely to be encountered, uncertainty of conditions affecting operations, and known influences that may cause a disruption of schedules. In specifying earliest allowable arrival time and latest allowable clearance time at locations near the end of a long march, greater tolerances are necessary than at beginning of march. This factor of safety and latitude for contingencies should be provided in the schedule and not in the manner of execution. *Movements must be executed according to schedule whenever possible.*

c. Logistical data.—The march day, rates of march, time-length and road space of columns, march graphs, shuttling data, types of march, and other pertinent information needed in timing of movements are included in FM 101–10 and FM 25–10.

d. Timing of successive columns.—The headway [2] between successive columns traveling in the same direction is computed by adding the time-length of the preceding column and the time-gap [3] desired between columns. Sufficient time-gaps may be prescribed between columns, serials, march units, or individual vehicles to permit cross movement of other traffic. If different rates of march are used, scheduling of successive columns will be greatly complicated, and provisions for passage of columns may be necessary. Further consideration of headway between columns is indicated in *e*(2) below.

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[2] Headway is defined as the interval of *time* between individual vehicles, march units, serials, or columns, measured from *head to head* as they pass a given point.

[3] Time-gap is defined as the interval of time between successive vehicles, march units, serials, or columns, as they move past a fixed point, measured from *tail to head.*

e. Timing of columns meeting from opposite directions.—(1) When two columns proceeding in opposite directions use a section of a one-lane roadway alternately (for example, a ponton bridge or other one-lane defile) the head of one column should not reach this section of roadway until the tail of the other column has cleared it.

(2) Where a series of columns use a section of one-lane roadway alternately in opposition directions, the headway between two successive columns must be equal to the combined time-lengths of the preceding column and the column from the opposite direction plus twice the time-distance of the defile at the prescribed speed plus the safety factor desired.

(3) When two columns marching in opposite directions will meet on a roadway having two or more traffic lanes, an effort should be made to have such columns pass each other at the intersection which has the heaviest traffic flow so that cross movements will not be unduly restricted by waiting for each column to clear individually.

f. Timing of intersecting columns.—The minimum headway necessary between intersecting columns is the time-length of the first column plus whatever time-gap is desired as a factor of safety.

■ 52. OPERATION.—A careful check of all considerations affecting traffic movement should be made before placing a schedule in operation, unless time is so limited that execution must be concurrent with planning. Operation of schedules is observed closely and prompt adjustments made where necessary to provide efficient operation or to accommodate additional movements.

CHAPTER 6

REGULATION

■ 53. GENERAL.—Regulation as used herein is the external control of traffic movement by control personnel as differentiated from measures such as march organization, technique, and discipline for the internal control of individual columns. It includes the use of traffic control equipment. Regulation normally is a function of military police, but under certain conditions it is delegated to engineers. Engineers regulate traffic at locations where their work is of prime importance, such as bridges, ferries, and approaches thereto; roads under construction; and water supply points.

■ 54. MISSION.—Regulation of traffic movements has as its mission the following:

a. Execution of control plan.

b. Promotion of free and orderly movement of traffic by on-the-spot prevention or reduction of impending conflicts and alleviation of unavoidable conflicts.

c. Provision of route and location information to drivers and column commanders.

d. Collection and forwarding of data pertinent to control of traffic movements, with recommendations for control plans.

e. Local adjustment of routing and scheduling necessary to meet emergency traffic conditions.

f. Enforcement of traffic regulations and restrictions.

■ 55. RESPONSIBILITIES.—The provost marshal, as commander of the military police unit and as a member of the special staff, is responsible for all matters pertaining to traffic regulation by military police. He prepares a plan for regulation of traffic, based on information of control requirements (par. 26*c*), and submits it to traffic headquarters for approval. Responsibility for execution of the control plan is delegated as indicated in figure 1.

■ 56. AUTHORITY OF MILITARY POLICE.—Military police assigned to traffic duty are obeyed as representatives of the commanding general, except that the senior officer present

may countermand the orders of the military police, if he considers such action necessary in accomplishing the mission of the command. In the latter event, the responsible officer must answer to the commanding general of the area for action taken and for any results that may follow. Subject to the foregoing, military police assist the movement of columns, make local adjustments in routing and scheduling, halt columns temporarily, and enforce movement priorities in conformity with traffic plans and orders.

■ 57. CONTROL SYSTEMS.—*a. Organizational control.*—Organizational control is the regulation exercised by a particular unit along its route of march. The objectives are to assure priority of road use to the unit or proper coordination with other traffic on the route. Under this control, regulation consists of escorting the column, providing traffic flow regulation at successive points of conflict, and assisting in meeting any emergency situation which may develop. Necessary guards and guides are furnished from column personnel.

b. Area control.—(1) Area control involves the regulation of all traffic moving within or through a given area (usually the tactical area of the unit). It is established whenever the number and type of movements in an area are such that unified control is necessary. Military police of the area concerned provide police regulation for all movements within their area, including movements of other echelons through or within the area. Control personnel of the area may be assisted by control personnel of passing columns, or by personnel from higher echelons during periods when such assistance is necessary. However, jurisdiction is transferred to control personnel of higher echelons or of units moving through the area only when specifically directed by higher headquarters.

(2) The designated area is organized into a variable number of subareas, each containing a number of traffic posts and patrols. An officer or noncommissioned officer supervises the activities of each subarea from a control post established at a key point, usually near an important intersection. Subareas may either consist of small areas embracing sections of several roads or be organized along routes divided

into sectors of suitable length. Their size depends on the traffic requirements, nature and extent of road net, degree of control needed, control facilities available, existence of towns and defiles calling for special treatment, and probability of interference by enemy action. The activities of the subareas are controlled through an area control station at traffic headquarters.

■ 58. CLASSIFIED ROUTES.—As part of the control plan, traffic headquarters classifies available routes in accordance with the degree of control necessary for proper regulation of traffic. Actual control imposed on these routes at any time is the minimum required to obtain desired results; and the full degree of control authorized by the classification prescribed is not employed during periods when lesser control will suffice. At intersections, the route having the higher classification determines the control classification. Control classifications of military routes are as follows:

a. Open.—An open route is a roadway over which only a minimum of supervision is exercised. Supervision is limited to control of traffic at intersections with routes of a higher classification and to occasional patrols. Organizational control normally is used on such routes.

b. Supervised.—A supervised route is a roadway over which limited control is exercised by means of traffic posts, traffic patrols, and to some extent by regulation of time of access to the route for major columns. Supervised routes are the type usually employed under area control when traffic requirements are not heavy.

c. Dispatch.—A dispatch route is a roadway over which full control, both as to priority of use and the regulated movement of traffic in space and time, is exercised. Strict regulation of traffic on these routes is necessary in order to carry out traffic plans. This type of route normally is employed under area control when the road net is limited and traffic requirements are heavy.

d. Reserved.—A reserved route is one that is set aside for the exclusive use of a designated unit or a special type of traffic, or for other specific purposes. Such reservations impose severe restrictions on use of all intersecting routes

and require a high degree of control to block access to the route by movements not authorized to use it Hence, such designations should be used only as necessary to insure unrestricted passage of highly important traffic. In designating a reserved route for a specific movement, the period of reservation should be definitely stated, and should be only as long as required for clearing the route and for actual movement of the column.

■ 59. EMERGENCY OPERATIONS.—*a. Alternate plans.*—Adjustment of traffic routing and scheduling frequently are necessitated by changes in the tactical situation, damage to roads, or traffic congestion. In instances where a breakdown of the traffic plan can be anticipated and if the road net allows, alternate plans are prepared to meet such an emergency. These plans may involve rerouting, rescheduling, and reassignment of control personnel. Alternate plans are drawn up in such detail as is practicable and go into effect immediately on occurrence of the emergency they are designed to meet.

b. Improvisation.—Traffic emergencies which cannot be anticipated or for which no plans have been made may require immediate solution in the field. Under such conditions, military police assist column commanders to take necessary immediate action without awaiting or seeking orders from higher authority. Decision as to the action to be taken is made by the column or unit commander. However, information and recommendations provided by control personnel should be given careful consideration in making this decision.

c. Notification.—Reports on emergency traffic situations and actions taken are transmitted immediately to traffic headquarters. This permits progressive adjustments of traffic plans throughout the affected area. Changes resulting from the emergency and from subsequent modification of plans by traffic headquarters are communicated to control personnel as soon as possible in order that they may make necessary modifications in their local handling of the emergency. Column commanders and others affected are likewise notified.

■ 60. COMMUNICATION.—The characteristics of military traffic and the conditions under which it operates require that supervision over movements be coordinated at all times and that traffic headquarters, column commanders, and control personnel be abreast of traffic conditions and changes in plans affecting their operations. Hence, an adequate system of communication must connect traffic headquarters with subareas of the control organization. Similarly, officer control posts of subareas and important control points and patrols must be interconnected. The system must be dependable under all conditions and permit rapid transmission of messages. Two-way communication should be provided, and the equipment used should be of a type that can quickly and easily be extended or moved to new locations. Whenever practicable, alternative, dissimilar systems of communication should be available to insure against total disruption if one is put out of service. Applicable systems are indicated below.

a. Radio.—Radio is desirable in that it can be placed in operation quickly and provides instantaneous two-way communication. However, its use is limited in certain instances because of secrecy requirement, poor transmission conditions, and possibility of interference by enemy radio activity.

b. Wire.—Wire systems are applicable to traffic communication in that they provide for rapid interchange of messages and are not readily tapped by the enemy. The principal disadvantages are the comparatively long time required to put the system into operation and the difficulties of maintaining service during periods of wet weather or heavy enemy activity. Telephone, telegraph, or teletype systems may be used, but telephones have the advantage of not requiring specially trained personnel for their use.

c. Messenger.—Messenger service as the sole means of communication usually is not rapid enough for general use with motor traffic, but is employed in conjunction with other means. Messengers should be provided with suitable transportation. Airplanes may be used over long distances; ¼-ton trucks, motorcycles, or bicycles are useful in moving through traffic jams on the road.

d. Air-ground.—Air-ground communication may be established by radio, loudspeakers, dropped and picked up messages, or panels. (See TM 1–465.)

■ 61. CONTROL DEVICES.—Full use is made of all traffic control devices available in the command. Control devices are of particular value when they replace personnel. Intersection regulation, particularly at night, is facilitated by the use of flashlight batons, white clothing, and other personnel equipment. Signs, delineators, and other markers are of general application in all regulation.

■ 62. AIRCRAFT.—Whenever tactical and visibility conditions permit, light, slow-flying aircraft may be used for hasty route reconnaissance, communication (par. 60*d*), and traffic regulation from the air. Because of opportunities provided for observation, qualified traffic personnel in airplanes can assist in general coordination and supervision over a wide area, particularly if airplanes are equipped with loud speakers or can communicate by radio with traffic personnel on the ground.

CHAPTER 7

TERMINALS

■ 63. GENERAL.—*a. Definition.*—A terminal is a transportation facility where troops, supplies, or transportation units are assembled, distributed, sheltered, or maintained. Traffic terminals may include cantonments; camp sites; bivouac, staging, and assembly areas; entrucking and detrucking points; depots; distributing points; railheads; truckheads; airports; automotive service installations; construction projects; clearing stations; command posts; hospitals; message centers; prisoner-of-war inclosures; regulating stations; ports; and similar establishments.

b. Relation between traffic and terminals.—Efficient use of transportation is dependent on proper coordination and prompt handling of movements at terminals. As the origin and destination of all important movements, terminals by their location, lay-out, and operation affect to a great extent the routing and scheduling of movements on the entire road net. To prevent congestion and avoid presenting the enemy with remunerative targets, terminals must be able to absorb the traffic flow approaching them; maintain dispersion of vehicles; and provide, through adequate loading, unloading, and dispatch facilities, an outgoing traffic flow at least equal to entering traffic flow or vehicular storage facilities sufficient to handle the excess of incoming over outgoing traffic flow.

■ 64. LOCATION.—*a. Elements.*—Important elements to be considered in the selection of a terminal site are the mission to be served, location with respect to the road net and to other installations, and adequacy of site.

b. Mission.—In order to fulfill its mission, a terminal must be so situated that it is accessible to all units that will use its facilities. It must be located to provide direct access from installations in the rear and must be near enough to units served to provide short, direct lines of communication.

c. Relative location.—A terminal must be so located in relation to the road net and the origins and destinations of traffic using the terminal that adequate facilities, as direct as

feasible, are provided for interchange of traffic; that circulation is facilitated; and that use of heavily traveled routes and intersecting courses are avoided so far as practicable. The site chosen must be at a distance from intersections or other locations where converging columns and heavy traffic tend to attract enemy observation.

d. Adequacy of site.—A terminal site should be adequate as to size, terrain, and camouflage possibilities. It should be large enough to accommodate all the needs of the terminal, including ample road net, parking areas, and turnarounds. Whenever possible, fairly level ground should be selected in order to avoid steep grades that would present difficulties to parked or moving vehicles. Terminal areas should be well drained in order to provide a solid foundation for movement and parking. At locations where enemy activity may be anticipated, attention must be given to camouflage considerations, including availability and characteristics of cover, availability of natural camouflage material, and general lay-out of area, especially of the road net and parking facilities.

■ 65. LAY-OUT.—*a. Circulation.*—Internal routing of traffic within terminals should generally provide for rotary operation, with loading facilities so located that vehicles move in a manner analogous to a factory assembly line. Entrances separate from exits are desirable, and cross and reverse movements should be avoided wherever possible. Routing will depend to a great extent upon whether vehicles enter the terminal loaded or arrive empty to be loaded. To comply with considerations of security, an orderly arrangement must be combined with nonuniform appearance and dispersion. Regular patterns should be avoided in the lay-out of roadways and facilities, but a systematic organization is essential.

b. Dispersion, deception, and camouflage.—Dispersion of facilities within a terminal area should be obtained to the extent practicable for passive protection from air attack. Deception as to use of the area is aided by avoiding creation of uniform traffic patterns, not permitting vehicles to stand in line, and using all roads equally. Vehicles being loaded or standing in parking areas should be covered with camouflage

materials and parked under trees or other shelter. Road, trail, and path surfaces are readily visible from the air, especially those of yellow clay. These surfaces are less conspicuous from the air, however, if they are made narrow. Turn-outs from the main roadway should be screened or the surface treated to conform as far as practicable to color and texture of surroundings. Stub-end roads are handled similarly, or a dummy road is extended beyond the stub end to avoid indicating terminal locations. Roads and paths should be wired. Rigid camouflage discipline must be enforced.

c. Parking.—Concealed parking areas should be available at or near the terminal to take care of trucks which are not in use or cannot be loaded immediately, and thus prevent congestion on approach roads. Such areas may be equipped for servicing and refueling waiting vehicles. Provisions should be made to accommodate the accumulation of vehicles that may be expected as a result of emergency suspension of terminal operations or blocking of exit from terminal.

d. Number and type of vehicles.—Lay-out of facilities should be such as to accommodate the number and type of vehicles expected to use them. Consideration must be given to maximum lengths, widths, and turning radii; cross-country mobility; and possibly to loading heights and vehicle capacities.

e. Loading facilities.—Loading facilities must be laid out to allow free flow of traffic, to accommodate vehicles expected to use them, to minimize time required to load and unload, and to comply with camouflage requirements.

■ 66. OPERATION.—*a. Responsibility.*—Planning and execution of traffic movements within a terminal are the responsibility of the officer in charge of the installation. Coordination with traffic headquarters is effected on matters pertaining to location with respect to road net, traffic lay-out, schedules, and control requirements.

b. Scheduling arrivals and departures.—To provide for efficient terminal operation and maintain control over traffic moves involved, arrivals and departures are scheduled to provide a uniform flow of vehicles during hours of operation. When other forms of transportation are involved in a trans-

fer of loads at a terminal, highway movements are scheduled to provide necessary coordination. If high priority movements require use of approach roads, other movements must be scheduled to avoid conflicts.

c. Internal routing.—Correlation of traffic movements within a terminal may be provided by a combined information and administrative control station at the entrance. By this means, incoming vehicles can be given information as to location of appropriate loading sites and roads leading thereto, and routing cards or other necessary papers may be issued. A corresponding station at exit may inspect dispatch slips and check unauthorized use of vehicles.

d. Control measures.—Traffic control posts are established at the entrance and exit of the terminal and at other points where traffic conflicts warrant. Signs are posted wherever needed, but in areas subject to hostile ground activity, signs should be replaced by guides to avoid disclosing location to enemy. Parking areas are clearly indicated, and vigorous control measures are taken to insure against accumulation of vehicles on roads or in unauthorized areas.

e. Night operation.—Since many terminal operations may take place at night, provision must be made for extinguishing unnecessary lights, completely obscuring necessary light sources, or operating with allowable intensity of reduced illumination (see current War Department blackout specifications). Routes may be marked with radioactive or reflecting delineators. Necessary directions and location of important installations are indicated by illuminated or reflectorized signs. Roads should preferably be restricted to one-way or alternate one-way traffic under blackout conditions.

f. Emergency operations.—Provisions may be made for action in case of fire, attack by mechanized forces or parachute troops, or other emergency, and routes may be designated for use by emergency vehicles. Immediate steps should be taken to obtain engineer assistance required in repairing or replacing roads put out of service. Engineer facilities may also be needed to aid vehicles in negotiating difficult sections of roadway.

CHAPTER 8

ORDERS

■ 67. GENERAL.—Combat orders include information and instructions essential for coordinated execution of traffic movements. (For composition and form of combat orders see FM 101–5.)

■ 68. WARNING ORDERS.—Warning orders convey advance information to subordinates in time to enable them to effect necessary preparations for carrying out impending operations. When a warning order has been given general distribution, matters fully covered therein need not be repeated in subsequent orders.

■ 69. MOVEMENT ORDERS.—Movement orders direct that certain movements be made. They prescribe the march mission and the limitations imposed by the higher unit. The destination, time of arrival or other time limitations, and route are prescribed where such items are necessary to obtain performance and coordination desired by higher authority. (See par. 354, FM 100–5.)

■ 70. MARCH ORDERS.—March details are prescribed in the march order prepared by headquarters responsible for conducting the march. (See FM 25–10.)

■ 71. TRAFFIC ORDERS.—The traffic order is prepared by traffic headquarters and issued as a paragraph of the administrative order. It should contain all information and regulations necessary for guidance of traffic using the road net. Standing traffic orders and regulations need not be repeated. If time permits and the situation requires, any or all of the following items may be included in the traffic order:

a. Time effective.—Whenever any provisions of the traffic order extend over a period of time different from that of other paragraphs of the administrative order, the time applicable in each instance should be stated.

b. Location of terminals.—Locations of supply, evacuation, and administrative establishments, and other traffic terminals usually are indicated elsewhere in the administrative order. However, information as to the location of all im-

portant traffic terminals is essential in the execution of the traffic order and should be indicated on the circulation map, if one is issued.

c. Routes.—Direction of movement on each important roadway, restrictions imposed by own or higher headquarters, route identifications, and control classification of each route should be indicated whenever practicable. Additional data as indicated in paragraph 42*f* may be included if necessary. Route information usually is shown on the circulation map.

d. Time and space restrictions.—If the use of a roadway is restricted by schedules, or if a roadway is reserved for the exclusive use of a designated unit or for other purposes during any period of time, such information should be stated in the traffic paragraph, shown on the circulation map, or indicated in a time schedule annex to the administrative order. If no vehicles, or only specially designated vehicles, are allowed to proceed beyond a specified point during hours of daylight or hours of darkness, such restrictions should be indicated on the circulation map.

e. Priorities.—Traffic priorities may be indicated by schedules or by time and space reservations. However, if no schedules exist, or if it is not practical to make time or space reservations, priorities for troop movements, class III and class V supplies, fortification materials, class I supplies, etc., should be stated specifically, unless they are covered in standing operating procedure.

f. Restrictions on type of traffic.—Whenever any type of traffic (such as foot troops, animal columns, or empty vehicles) is restricted from using or is required to use specified routes, these limitations should be indicated clearly.

g. Protective measures.—Measures pertaining to security or passive protection of traffic movements (such as limitations on traffic density, special routing or scheduling, or blackout operation) may also be prescribed in the traffic order.

h. Control.—Organization of the area into subareas is indicated when such subdivision is necessary. Locations of traffic control posts and officers' control stations may be prescribed, but latitude should be allowed for conditions which may require that such establishments be changed.

Marking of routes and other control measures may be indicated.

i. Communication.—Unless indicated elsewhere or already in effect, all general information pertaining to the location of traffic headquarters or other traffic establishments and to communication regulations affecting them should be stated.

j. Construction.—Functional specification of road and bridge work required and the priorities of such work should likewise be indicated in the traffic order.

■ 72. STANDING OPERATING PROCEDURE.—The administration and control of traffic is simplified and uniformity of performance is promoted when the standing operating procedure used by divisions and higher units set forth those traffic instructions, control measures, and procedures that can be standardized. Items covered by standing operating procedure usually are not repeated in traffic orders. However, any departure therefrom is indicated. The following are examples of items pertaining to traffic operations that may be covered by standing operating procedure:

a. Organization of command into columns or column.
b. Method of establishing liaison.
c. Priorities of movement.
d. Use of lights.
e. Type of march.
f. Halts.
g. Shuttling procedure.
h. Speeds.
i. Procedure of posting markers and guides.
j. Method of regaining position in column after dropping out.
k. Action in event of air or mechanized attack while en route, including method of sounding alarm.
l. Organization of transportation pools.
m. Normal supply routine.
n. Maintenance procedure.
o. Protective measures including limitations on traffic density.
p. Communication.
q. Emergency operations.
r. Reports.

CHAPTER 9

CIVILIAN AND EVACUATION TRAFFIC

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SECTION I

COORDINATION WITH CIVILIAN TRAFFIC

■ 73. SCOPE.—This section sets forth practices for coordination of civilian and military motor movements in continental United States or other friendly territory. Full coordination is sought between civilian and military traffic. Nevertheless, after an area has been declared a theater of operations, the military commander will adopt such measures as are necessary to prevent civilian movements interfering with tactical operations. If martial law is declared, the military commander assumes control of *all* civilian movements.

■ 74. RESPONSIBILITY.—Responsibility for coordination of civilian and military traffic and cooperation with civilian traffic authorities is a function of G–4 section of the general staff. (See pars. 5 and 6.)

■ 75. COORDINATION WITH CIVILIAN TRAFFIC AUTHORITIES.—*a.* Procedure for obtaining coordination between military and civilian traffic authorities within continental United States, together with kind and character of the information necessary, and forms for its timely and rapid exchange, is contained in FM 25–10.

b. During wartime, secrecy requirements governing all troop movements may restrict to a large extent information furnished civilian authorities. Such information must be confined to that necessary for accomplishment of the movement and must be carefully safeguarded.

■ 76. ROUTING.—Routes selected should avoid congested areas and roads or other traffic bottlenecks whenever consistent with the purpose of the move. Bypass routes should be used whenever practicable.

a. Establishment of routes.—Military and civilian traffic authorities in consultation should establish routes and alternative routes for military movements through cities. These routes can be marked by civilian authorities, and measures for the control and coordination of military and civilian traffic can be concentrated thereon.

b. Multiple routes.—In order to minimize interference with civilian traffic, long columns may sometimes be divided into several shorter columns which are routed over separate routes. In such cases, plans must provide for the reassembly of the column at the far side of the congested area.

■ 77. SCHEDULING.—When practicable, military columns should pass through congested areas during periods when the density of civilian traffic is not critical. Night moves afford least interference with civilian movements; day moves should avoid the "rush" hours just before and just after the normal workday. Periods and areas of abnormal traffic density caused by athletic contests, fairs, and other special events should be considered in routing and scheduling.

■ 78. MARCH FORMATIONS FOR PASSAGE THROUGH CONGESTED AREAS.—Whenever consistent with tactical and administrative considerations, the type of march formation employed in passing through congested areas should be such as to expedite the military movement and at the same time minimize interference with civilian traffic.

a. Close column.—Close column affords the most compact grouping of vehicles and thus provides the shortest time-length of column. Close column, however, prohibits the infiltration of civilian traffic into or through the march unit. The formation of the column into small march units (15 to 20 vehicles), separated by a time-gap of 2 to 5 minutes, facilitates the passage of cross traffic. When close column is used, each march unit may have to halt at the outskirts of the congested area until stragglers close up. Average speed of column should conform to that of routine civilian traffic unless the roadway is reserved for the movement. An escort should be provided for each march unit.

b. Open column.—(1) Intervehicular spacings used in open column will provide ordinarily for the infiltration of civilian

traffic into the column. Heavy cross traffic, however, will be seriously impeded unless large speedometer multipliers are used or sufficient time-gap is provided between march units. An escort normally is required unless very large speedometer multipliers are used. Average speed of column should usually conform to that of routine civilian traffic.

(2) When an open column formation is being used in uncongested areas, passage through congested areas will usually be facilitated and less interference to civilian traffic will be caused if each march unit successively adopts a close column formation before passing through the congested area. In this manner, the relative merits of open and close column are utilized to best advantage and the total time lost is only that required for the longest march unit to close up.

c. Infiltration.—Infiltration marching, obtained by dispatching vehicles individually or in small groups at a rate which permits their ready absorption in the normal traffic flow, involves a minimum of interference with civilian traffic. Successful application of this method of marching requires that routes be clearly marked, that each vehicle conform strictly to traffic regulations prescribed for civilian traffic, and that individual drivers be well trained. No traffic escort and little prior planning are necessary when this method of marching is used. Because of the time consumed in changing from open or close column, infiltration usually is not warranted solely for the purpose of passage through congested areas.

■ 79. HALTS.—Halts should usually be planned to occur outside areas of high traffic densities unless special facilities are provided therein for parking vehicles. However, other considerations, such as fueling, water supply, messing arrangements, and bivouacking, may be deciding factors. Vehicles should be parked off the road or on minor traffic streets whenever possible. Intersections must not be blocked. Civilian authorities may indicate desirable halt locations and permanently mark them.

■ 80. CIVILIAN AID.—Arrangements made with civilian authorities to facilitate passage of military columns may include the provision of civilian police escorts, posting of police

officers to regulate traffic along the route, clearing of routes of all other traffic, and provision of special controls and communication system.

■ 81. CIVIL TRAFFIC REGULATIONS.—Military or civil police on duty will be obeyed strictly and state and local highway regulations will be observed carefully. Military columns may disregard civil traffic regulations only at request or with consent of appropriate civilian authorities, and then only if necessary precautions are taken to insure safety to both military and civilian traffic. Safety precautions necessary include posting of control personnel at all locations where traffic lights, stop signs, or turn prohibitions are to be disregarded and use of escorts by each march unit where speed limits, usual direction of movement, or rules pertaining to truck traffic are to be violated. Under martial law, civil traffic rules will be supplanted or modified as necessary by special military traffic regulations.

SECTION II

EVACUATION

■ 82. NECESSITY.—Normally, complete evacuation of the civilian population is undesirable, both from the military viewpoint and because of its effect on the civilian population. Evacuation is dictated by the military situation and will be carried out only when necessary for the successful operation of our own troops and to spare the civilian population from the hardships of war. The relative safety of the civilian population at home or in evacuation, together with the means available and the time necessary for the operation, are dependent upon the military situation. Advantages to be secured must be carefully weighed against the disadvantages of such a move, and the resulting decision must be in furtherance of the national effort.

■ 83. ADVANTAGES.—In a theater of operations, evacuation of the population from the area of contact with the enemy is advantageous both to the military forces and to the population. Areas, lines of communication, and facilities are freed for the exclusive use of the military forces and unham-

pered maneuver room is obtained. Civilians, by their removal from the danger zone, are enabled to avoid the dangers of the battlefield and possible panic with its attendant disastrous results.

■ 84. DISADVANTAGES.—Disadvantages consist of dislocation of normal industry; reduction or stoppage of normal power, communication, transportation, and other utilities; clogging of lines of communication (highways and railroads) by movements of the evacuated population; and diversion of military effort to the problems entailed by the evacuation. The population is torn from its home surroundings, forced to leave its property and normal means of livelihood, and in general is required to undergo all the hardships of a major disaster. The objections to movements of entire populations are so great that civilian evacuation will only be accomplished when the military situation dictates that it be done, and then only in accordance with well-organized plans.

■ 85. STAFF RELATIONSHIPS.—The G–1 section of the general staff is charged with the general planning for the evacuation of civilians. (See FM 101–5.) In planning and conducting the movement phases of an evacuation, G–1 coordinates with G–3 for effect on military movements; and with G–4 for transportation, routes, schedules, and measures for the control of evacuation and refugee traffic.

■ 86. PLANNED EVACUATION.—A planned evacuation usually is accomplished in two phases:

a. Voluntary phase.—The initial phase of evacuation will occur sometime prior to expected land engagements of military forces in the area. During this period, individuals (except those engaged in essential services) are permitted or encouraged to evacuate voluntarily. Such voluntary evacuees will be largely those who possess a safe place of refuge and are able to provide their own transportation or utilize public carriers. The removal of certain classes (such as institutionalized individuals, the aged and infirm, expectant mothers, children, and persons engaged in nonessential services) is accomplished during this period. Provision of transportation, shelter, and essential services for

these classes may be necessary. Livestock are transported to rear areas if practicable. As most of the vehicles involved have separate destinations and times of movement, traffic resulting from voluntary evacuation will be largely of the nature of individual movements. Rapid dispersion over available roads may be expected except for the group movements of classes for which special facilities are provided.

b. Forced phase.—The forced phase of evacuation is the period during which civilians, except those serving with or necessary to the military forces, are cleared from the area. This phase is ordered by the military commander and is initiated in time to clear the area before it is needed for the conduct of intensive military operations. At first, forced evacuation may be merely an acceleration of the voluntary phase. However, as the need for military movements becomes progressively greater, evacuation movements must be further systematized and regimented. The regimented stage may be characterized by employment of evacuation columns or convoys and a program by which movements are routed and scheduled in such a way as to provide a minimum of interference with military operations.

■ 87. PLANNING OF MOVEMENTS.—*a. General.*—Efficiency in evacuation is dependent largely on the thoroughness of advance preparations. Plans for evacuation movements and their control must be initiated as far ahead as the probable need of evacuation can be foreseen, and then developed in as complete detail as time permits. Traffic plans must be coordinated with evacuation plans, and be sufficiently flexible to permit revisions under changing conditions and to provide for rapid execution if sudden need for evacuation arises. The need for large numbers of trained personnel must be anticipated.

b. Organization of evacuation area.—(1) *Zones.*—Progressive evacuation from front to rear will be facilitated if the area is organized into evacuation zones based roughly on population distribution, road net available, and tactical considerations.

(2) *Districts.*—Each zone or area is organized into districts along the line of familiar divisions, such as school districts,

police precincts, census tracts, counties, or similar areas. These districts afford a basis for formation and functioning of local control agencies, designation of refugee evacuation centers, and scheduling of movements. Existing organizations, such as civilian defense organization and local governments, should be used to the greatest extent possible. Schoolhouses, bus stations, villages, or similar places which offer facilities necessary for the care, organization, and dispatching of evacuees, are designated as refugee evacuation centers.

c. Population census.—Information obtained during registration and classification of civilians will include data on number who will evacuate or be evacuated during the voluntary phase and those who will remain until the forced phase. Also, figures are obtained or estimates made of the number which will use each type of transportation.

d. Highway transportation.—An inventory of all vehicles available, public and private, is taken and the number and types of vehicles which will be available after voluntary evacuation has taken place is determined. Availability of vehicle operators and mechanics and best procedure for obtaining their use are ascertained. An estimate is then made of additional vehicles and operators required, and plans are formulated for their provision at places and times needed. Shuttling may be necessary.

e. Destination(s).—Location(s) of reception center(s) and the rate at which evacuees can be absorbed must be known for planning routes and schedules.

f. Routes.—During voluntary phase of evacuation, few restrictions may be necessary on use of roads. As military movements become greater in volume and the evacuation accelerates, evacuation traffic is assigned roads which may be used without interference with military operations. The locations of refugee evacuation centers in relation to reception centers must be studied in order to assign routes providing minimum conflict points between movements from the various districts. Routes chosen should avoid traffic bottlenecks wherever feasible. The thorough marking of evacuation routes in advance is essential. Alternate routes should be designated, wherever practicable, to provide for

bypassing possible road blocks. Civilian crews and equipment are provided to repair damage to roads or bridges and to install facilities for emergency use. Maps of routes are issued to guide traffic and facilitate observance of orders.

g. Timing.—Due to the lack of training and discipline of civilians and the many variables in conditions and operations which will be encountered, forced evacuation movements are scheduled in broad terms, such as days, parts of days, or other appropriate intervals.

(1) The program of evacuation movements must permit the clearing of the area in time to avoid conflict with military operations. Zones are cleared successively from the front to the rear.

(2) Overtaxing of roads, supply points, and shelter areas is prevented by scheduling use of evacuation facilities by successive groups of evacuees. If the road net is extensive and movements light, infiltration schedules may be used. These schedules may designate the time of movement of groups identified by automobile license numbers (the last one or two numbers of the license identifying the group), or may prescribe the clearing of districts progressively, or may incorporate other means of designating and alloting time to portions of the population. If the road net is restricted and danger of disruption of military movements exists, the formation of evacuation movements into columns and appropriate scheduling thereof may be necessary in addition to a time schedule for coordination of districts. Rear areas may be evacuated on infiltration schedules simultaneously with and in preparation for the evacuation of forward areas on column schedules.

(3) Coordination of individual columns at conflict points must be effected largely in the field. Whenever a conflict between military and evacuation movements develops, the evacuation traffic is halted (off the road if possible) until military traffic has passed.

h. Control of evacuation traffic.—Measures for the control of evacuation traffic will depend on whether evacuation is voluntary or forced. Normal control measures, including the posting of proper instructions concerning military routes, traffic regulation at conflict points, and occasional patrols

within vicinity of cities, should suffice for the voluntary phase. Civilian agencies should have little difficulty in handling this phase of evacuation. The forced phase of evacuation, however, may require careful and continuous supervision of evacuation movements. Aircraft are particularly useful in this phase (par. 62). To effect compliance with plans and orders during the forced phase of evacuation, a complete area control organization and the escorting of evacuation columns may be required. Columns should be formed of vehicles of similar operating characteristics and organized into march units of small size (not exceeding 20 vehicles in number). The lead driver of each march unit should be carefully selected and instructed. Military police and specially detailed troops augment civilian control personnel where necessary. Control measures may include any or all of the following:

(1) Intersection regulation.
(2) Use of guides and column control personnel.
(3) Employment of patrols along the routes.
(4) Establishment of control stations.
(5) Means of barring access to military routes.

i. Supplies and essential services.—Supply points and establishments for rendition of services essential to the welfare of the evacuees are located along evacuation routes. Facilities for refueling vehicles are provided at appropriate intervals. Communication facilities may be necessary to permit the agency directing the evacuation to keep abreast of the progress of movements, to receive and transmit timely information concerning conditions along the routes and at evacuation terminals, and to effect any necessary adjustment in plans. The existing communication system is utilized so far as practicable. Additional facilities, if necessary, may be provided by radio, wire, aircraft, or messengers.

■ 88. ORDERS.—*a. Warning orders.*—Warning orders are issued sufficiently in advance of a forced evacuation to permit fueling and servicing of vehicles and completion of final preparations.

b. Evacuation orders.—Evacuation orders designate the schedule of evacuation, direct all concerned to carry out pre-

viously assigned duties, and contain any additional instructions necessary to insure coordinated performance.

■ 89. EVACUATION IN PANIC.—Traffic generated by a spontaneous, panicky, mass movement is heterogeneous, undisciplined, and of such high densities that all roads may be choked. Drastic measures, applied without hesitancy or sympathy for distress, are required to bring such traffic under control before severe congestion renders effective military movements impossible. Such measures may include—

a. Choking off of evacuee movements at the source until a lull in military movements occurs.

b. Forcible clearance of roads needed for military purposes and the barring of access thereto.

c. Direction of evacuees to areas clear of military traffic routes where they can be absorbed temporarily and brought under control.

d. Rapid organization of movements into columns.

e. Escorting of movements.

f. Assistance to evacuees by commandeering and supplying transportation.

■ 90. NONEVACUEES.—Upon the approach of the enemy, civilians who have not been evacuated as a part of a planned movement are required to remain off all highways. Because of unpredictable military requirements, casual traffic at such times cannot be allowed. Force is used as necessary to enforce the above. However, advance planning usually can prevent such a situation from getting out of hand without frequent resort to force.

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