UNITED STATES MARINE CORPS
Logistics Operations School
Marine Corps Combat Service Support Schools
PSC Box 20041
Camp Lejeune, North Carolina 28542-0041

MTAC 3204

STUDENT OUTLINE

MOVEMENT CONTROL

LEARNING OBJECTIVES

a. Given the billet of major subordinate command motor transport chief and references, participate in movement control planning, per the references. (35XX.06.04)

b. Given a map, a map overlay, grid coordinates, the billet of a major subordinate command motor transport chief, and references, execute major subordinate command (MSC) movement control plan/highway regulation plan, per the references.

c. Enabling Learning Objectives:

(1) Given the billet of a major subordinate command motor transport chief and references, identify the appropriate terms associated with movement control definitions, per the references. (35XX.06.04a)

(2) Given the billet of a major subordinate command motor transport chief and references, compute unknown march factors, per the references. (35XX.06.04b)

(3) Given the billet of a major subordinate command motor transport chief and references, compute unknown rate factors, per the references. (35XX.06.04c)

(4) Given a map, a map overlay, grid coordinates, the billet of a major subordinate command motor transport chief and references, select the main supply route, per the references. (35XX.06.05a)

(5) Given a map, a map overlay, grid coordinates, the billet of a major subordinate command motor transport chief and references, identify critical points, per the references. (35XX.06.05b)

(6) Given a map, a map overlay, grid coordinates, the billet of a major subordinate command motor transport chief and references, establish checkpoints to segment main supply routes, per the references. (35XX.06.05c)

(7) Given a map, a map overlay, grid coordinates, the billet of a major subordinate command motor transport chief and references, establish control measures for routes, per the references. (35XX.06.05d)

OUTLINE

1. Movement Control. The planning, routing, scheduling, and control of personnel and cargo movements over lines of communication. Movement Control entails validating movement requirements, allocating resources, coordinating movements, and tracking personnel and cargo during movements.

2. Principles of Movement Control.

a. Centralized Control/Decentralized Execution.

(1) Centralization rests with the highest level responsible for integrating logistics support in order to balance requirements with capabilities and available resources.

(2) Decentralized execution allows supporting units the flexibility to allocate available resources to meet mission requirements, thus giving the supporting unit the freedom to assign assets to accomplish the mission.

(3) The controlling agency decides what support is to be delivered; the supporting agency decides how the support is to be delivered.

b. Regulated Movements. Since most transportation networks are shared by a number of units, it is crucial to regulate movements on those networks in order to prevent congestion.

(1) Regulate cargo apportionment in order to maximize lift capabilities of available vehicles, thereby reducing traffic density.

(2) Regulate traffic using various means, as outlined in the Highway Regulation Plan.

c. Fluid and Flexible Movements. Movement Control planners must maintain flexibility to allow un-interrupted flow of supplies, equipment, and personnel in spite of rapidly changing conditions and priorities. The transportation system must be effectively linked with command and control nodes to allow access to information and timely reaction.

d. Effective Use of Carrying Capacity. Unit leaders must ensure that assets are utilized to their fullest potential and that the assets are kept loaded and moving as much as possible while balancing maintenance and rest requirements.

e. Discipline. Keeping vehicles on the road, then returning them to the owning unit as quickly as possible upon completion of the mission is critical. Additionally, March Discipline includes the following:

(1) Correct and safe driving.

(2) Immediate response to orders en route.

(3) Obeying traffic regulation and rules of the road.

(4) Observing safe and correct speeds, gaps, and positions within columns.

(5) Prompt relay of signals and information.

(6) Proper care of equipment.

(7) Strict observation of halt restrictions/rules.

(8) Strict compliance with route restrictions and control measures.

f. Forward Support. Movement planners must endeavor to keep transportation and logistical support as far forward as possible in order to have a positive impact on the tactical situation. The effectiveness of forward support will in most cases be dependent upon the clearance and reception capabilities of forward units.

3. Movement Control Agencies.

a. MAGTF S-3.

(1) Plans and directs the positioning and maneuver of combat and combat service support units within the MAGTF area.

(2) Establishes priorities for using Main Supply Routes (MSR's), in coordination with the MAGTF S-4. Maneuver will normally have priority over movements.

b. MAGTF S-4.

(1) Develops logistics support plans to support the command's transportation effort.

(2) Assists the MAGTF S-3 in establishing priorities for use of MSR's.

c. Logistics Movement Control Center (LMCC).

(1) Movement Control agency within the CSSE, normally under the staff cognizance of the G-3, FSSG.

(2) Provides centralized movement control and highway regulation for moving passengers, cargo, and equipment into, out of, and within the MAGTF area, normally at the MEF or MEB level.

(3) Ensures effective and efficient use of available transportation capability.

(4) Coordinates unit movements.

(5) Coordinates with MAGTF G/S-2, G/S-3, engineers, and MP's for route classification, selection, and control.

(6) Plans, routes, schedules, and manages traffic in accordance with command priorities.

(7) Issues convoy clearance.

(8) Coordinates large unit movement tables.

(9) Coordinates with MP's on enforcement of the Highway Regulation Plan.

(10) Places Movement Control Teams (MCT's) at key transportation nodes and other critical locations.

d. Unit Movement Control Center (UMCC). Units down to the battalion/squadron level stand up a UMCC when needed in order to:

(1) Ensure units are prepared for embarkation and movement.

(2) Ensure organic support assets are in place.

(3) Coordinate movement of the unit.

e. Movement Control Team (MCT).

(1) Expedites movement control operations and unit movements.

(2) Task organized under the LMCC and located at key transportation locations.

(3) May also be responsible for providing sustainment, messing, or maintenance support for units conducting movements.

4. Movement Control and Highway Regulation Planning. Movement Control within the MAGTF area is normally accomplished via the Highway Regulation Plan, which is normally contained as an appendix to Annex D, Combat Service Support. In formulating the Highway Regulation Plan, the following are considered:

a. Selection of MSR's. The MSR must be adequate to support vehicle weights and dimensions as well as the anticipated traffic volume. Final approval of MSR's rests with the MAGTF G/S-3.

b. Determination of Critical Points. Areas of interest to movement planners which have the potential to impede or halt a movement is considered a critical point and treated accordingly.

c. Establishing Checkpoints to Segment the MSR.

(1) Checkpoints are used to identify start points (SP's), release points (RP's) and enroute checkpoints to allow quick location of units and dissemination of information.

(2) Checkpoints allow movement planners to segment the MSR in the Highway Regulation Plan in order to state changing conditions, restrictions, or classifications on a given route.

(3) Checkpoints are usually located at the following locations:

(a) Major crossroads.

(b) Locations where road conditions change.

(c) Major supply or service areas.

(d) Geographic or unit boundaries.

(e) Assembly areas.

d. Establish Control Measures for Routes. Control measures must allow the controlling agency to exercise control while not impeding the execution of movements along the route. Control measures are based on engineer route classifications, planned or anticipated traffic volume, METT-T, critical points, and the ability to enforce the control measures. The following are the primary methods for exercising control on a given route:

(1) Open Route. Any unit may use this route without convoy clearance. Minimal control is exercised. Least restrictive control measure.

(2) Supervised Route. LMCC/UMCC will specify the size of convoys, type of traffic, or certain characteristics of vehicles that may require convoy clearance. Limited control is exercised.

(3) Dispatch Route. LMCC/UMCC will exercise full control of the route, requiring a movement credit for any vehicle or group of vehicles.

(a) Movement Credit. Issued by LMCC/UMCC as an allocation to move a certain number and type of vehicles over a certain road between specified times. The movement credit will be stated as a series of alpha-numeric characters referred to as a movement number or credit and will specify the time that the first vehicle and last vehicle will enter and exit the route.

(4) Reserve Route. Reserved for particular unit or type of vehicle. Usually used when one unit must pass another forward, when units are withdrawn, or when the reserve is committed.

(5) Prohibited Route. Route closed to all traffic, possibly due to washout, destroyed bridges, construction, or civilian traffic density.

5. Routing. The process of coordinating or directing movements on the MSR's, adhering to the following considerations:

a. Balance. Matching vehicle characteristics with the route.

b. Separation. Allocating road space to ensure movements do not conflict.

c. Distribution. Allocating as many routes as possible to reduce congestion and disperse units.

6. Principles of Routing.

a. Assign highest priority traffic to routes that provide minimum time-distance.

b. Consider sustainment capabilities of roads and bridges.

c. Separate motor movements from foot movements.

d. Separate military and civilian traffic.

7. Scheduling. The process of coordinating times for road movements and issuing convoy clearances in order to accomplish the following:

a. Apply command priorities.

b. Reduce delays, conflicts, and congestion.

c. Plan large unit or high priority movements.

d. Reserve time for route maintenance.

e. Make changes to allow to changes in the tactical situation.

8. Fundamentals of Scheduling.

a. Movements on routes requiring clearance must be scheduled.

b. Movements crossing unit boundaries must be scheduled and coordinated with movement control agencies in the area to which the unit is moving.

c. Large unit movements must be scheduled.

d. Treat a unit movement as one movement, regardless of the number of serials or distance involved.

e. Method of scheduling will be based on the control measures for a given route.

f. Scheduled movements normally granted convoy designations along with the movement credit.

(1) Convoy designation number assigned as follows:

(a) First two numbers indicate the day of the month.

(b) National Symbol, i.e. US.

(c) Movement Authority, i.e. MC, SP, etc

(d) Two numbers indicating serial number of move.

(e) Letter designating which element/serial.

(f) Serial number and letter designation may be modified to reflect a particular unit.

9. Scheduling: Basic March Planning Terms. Some basic terms and definitions apply to scheduling and march planning. The following are definitions used to describe the relative position of a convoy or vehicle in both time and space:

a. Distance Factors.

(1) Length. The area of roadway occupied by a march column, measured from the front of the lead vehicle to the rear of the trail vehicle. Length can also apply to a single vehicle, measured from front to rear.

(2) Gap. The designated distance between elements in a column or between successive columns as measured from the rear of one element to the front of the following element.

(3) Lead. The linear spacing between the heads of elements in a column or between heads of successive vehicles, serials, march units, or columns.

(4) Road Space. The total length of the roadway occupied by a march column to include additional space added for safety and flexibility.

(5) Road Distance. Distance from point to point on the road, usually expressed in kilometers or miles.

(6) Road Clearance Distance. The total distance that the head of the column must travel for the entire column to clear a given section of the road. It is the sum of the column's length plus road distance.

b. Time Factors. Convoy planners must be able to determine the time that a column will pass a particular point on a route. In doing so, the planner must calculate how long it will take a column to go from one place to another.

(1) Pass Time (Time Length). The time required for a column or element to pass a given point. Time length may also be applied to a single vehicle.

(2) Time Gap. The time measured between the passing of the rear of one element or vehicle and the front of the next as it moves past a given point.

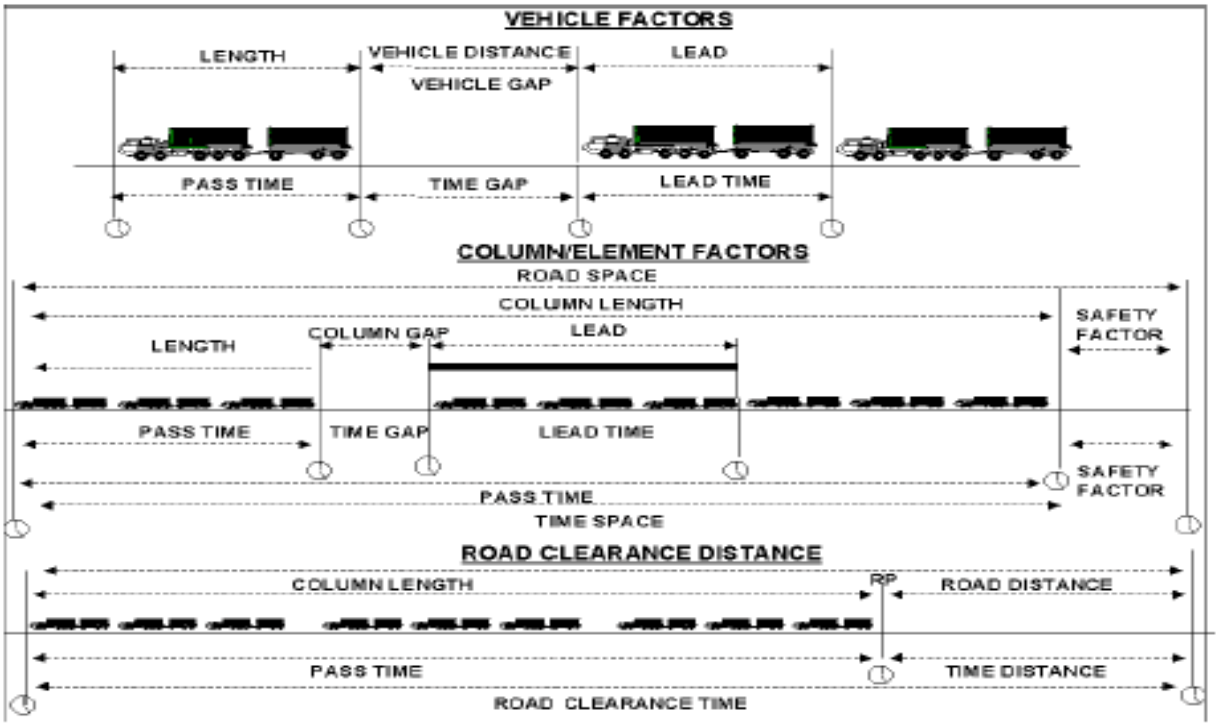
(3) Time Lead (Highway). The time measured between heads of individual vehicles or elements and heads of the next vehicles or elements as they pass a given point.

(4) Time Space. The time consumed while a column or element proceeds past a given point en route. It includes time gaps between subordinate elements and additional time added for safety or flexibility.

(5) Time Distance. The time required to move from one point to another at a given rate of speed.

(6) Road Clearance Time. The total time a column or element is required to travel over and clear a section of route. Road clearance time is equal to the sum of time distance and

time length.



c. Measuring Movement. A movement is measured by finding how long it takes to move a given distance. Convoy planners use three terms to express rate of movement:

(1) Speed. The actual rate at which a vehicle is moving at a given time.

(2) Pace. The regulated speed of a column or element as set by the lead vehicle. The pace setter continually adjusts the pace of the column to road, traffic, terrain, and weather conditions.

(3) Rate of March. The average number of miles traveled in any specific time period. Includes time allocated for short, periodic halts and short delays. Does not include long halts such as those allocated for messing or overnight stops.

10. Distance, Rate, and Time Calculations. With respect to distance, rate and time, we can calculate any unknown if there are two known factors:

a. Distance equals rate multiplied by time (D=R/T).

b. Rate equals distance divided by time (R=D/T).

c. Time equals distance divided by rate (T=D/R).

d. Calculating Arrive Times. To calculate the arrival time at checkpoint one (CP1) from the start point (SP), take the distance to CP1, divide by the planned rate of march, and multiply by 60. Add this time to the arrive time at the SP to determine arrival time at CP1. To calculate the arrival at the second checkpoint (CP2), take the distance from the CP1 to CP2, divide by the rate of march, and multiply by 60. Add the amount of time to the arrive time at the first CP to determine the arrive time at CP2.

e. Calculating Clear Times. The clear time is the time on the clock that the last vehicle in a column will have passed a given point. In calculating the clear time of a checkpoint, the planner must determine the pass time, which is the elapsed time that it takes a column to pass a given point. Once pass time is determined, the clear time can be calculated by adding the elapsed time. Determining the pass time requires four calculations: density, time gaps, road gaps, and pass time.

(1) Density. Density is calculated by dividing the constant 1000 by the vehicle gap, then adding the average vehicle length.

D=[1000/Vehicle Gap]+Avg. Vehicle Length

(2) Time Gaps. Time gaps is calculated as follows:

Time Gap=[(# of march units-1)x(march unit time gap)] +
[(# serials-1)x(serial time gap-march time gap)]

(3) Road Space. Calculate road space by using the following formula:

Road Space=(#of vehicles/density) + ((time gaps x rate)/60)

(4) Pass Time. Pass time is then calculated by multiplying road space and the constant of 60 (minutes) and dividing that number by the rate.

Pass Time = (road space x 60)/rate

f. Rest Halts. The march rate will compensate for short halts, but not for scheduled rest halts. Rest halts should be taken at checkpoints. In order to account for rest halts, add the elapsed time for the rest halt to your pass time, which will then adjust your clear time by the duration of your halt.

g. Tabular Representation of Arrive/Clear Times. Depict your calculations graphically on your Movement Order using the following method:

Checkpoint	Arrive Time	Clear Time
1	0800	0833
2	0812	0845

h. Extra Time Allowance (Extal). For larger movements, extra time is added to the serial's pass time, depending on the number of vehicles per serial. Use the following criteria for adding time to account for larger numbers of vehicles:

(1) 25-37 vehicles = 1 minute

(2) 38-62 vehicles = 2 minutes

(3) 63-87 vehicles = 3 minutes

REFERENCES:

1. MCRP 4-11.3, Rigging Operations

2. FM 55-15, Transportation Reference Data

3. MCWP 4-11.3, Transportation Operations

4. MSTP 4-0.1, Movement Control

5. FMFM 4-9, Motor Transport

6. TM 11240-14/2, Logistics Considerations For Motor Transport Convoy Operations in a Guerrilla Environment