

RECOMMENDED JOB RELATED  
PHYSICAL PERFORMANCE TESTS  
FOR THE  
STATE POLICE TROOPER CLASS (MICHIGAN)

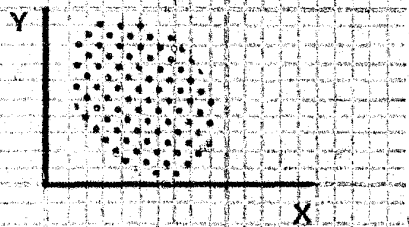
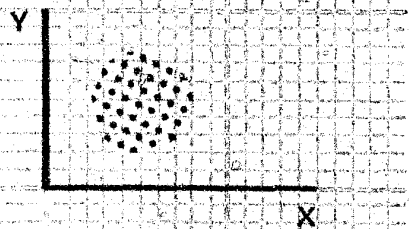
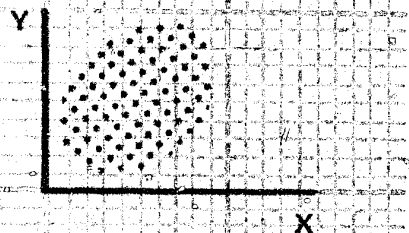
December, 1975

RESEARCH REPORT

Test Development  
and Validation Section

State of Michigan

DEPARTMENT OF CIVIL SERVICE



57361

FINAL REPORT: Recommended Job Related Physical Performance Tests  
for the State Police Trooper Class (Michigan)

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FOR: Michigan Civil Service Commission  
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ACQUISITIONS

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#### UPDATE

During the presentation of this report, discussion of the Drag and Lift test brought forth the suggestion that the 100 lb. weight be reduced to 70 lbs. The reasons for this were that the minimum itself was arbitrary and that 70 lbs. weight would still measure ability to be trained to drag and lift a human body of average weight without being unfair to people whose own body weight did not much exceed 100 lbs. It was also pointed out that people could, with proper training, learn to lift their own weight as in a fireman's carry.

Dr. Foss concurred with this and suggested that 70 lbs. be used until further study could indicate the most ideal weight.

Barbara Showers  
Test Research Section  
Department of Civil Service  
February 5, 1976

#### I. Introduction

The recommended physical performance test for Michigan State Police Troopers described in this report represents our efforts to meet three main objectives and criterion defined by the Michigan Civil Service Commission, Bureau of Selection. They were as follows:

1. that a demonstrably job-related physical performance test for the State Police Trooper class be developed;
2. that an estimate of minimum acceptable levels of test task performance that would be needed to successfully perform the related job task be made;
3. and that the recommended test tasks be evaluated to identify those which would be more difficult for women than for men.

These objectives and criterion are met in Section II through V of the report. Mr. James Sahakian, a second year graduate student in Exercise Physiology in the Department of Physical Education at The University of Michigan, ably assisted in devising and evaluating the recommended physical performance test items. Dr. Barbara Showers and Mr. Ray Poole of the Michigan Department of Civil Service, Bureau of Selection, provided materials and assistance essential to the research of current practices for evaluating applicants, recruit training procedures, and job analysis survey results both for the State of Michigan and other jurisdictions.

Section VI of this report contains information that was gleaned from various written materials reviewed in the process of meeting the objectives as previously stated. In many cases, these are presented simply as short "trigger" statements that upon review of the original source should provide assistance to persons charged with implementing the proposed physical performance evaluation procedures. In some parts of Section VI, judgemental statements regarding some aspects of the ongoing recruit training program and physical fitness program are made. Although outside the specific charge of our contract, these statements are included since the matters of physical performance screening, pre- and post-academy evaluation, optimum recruit training procedures, maintenance programs and periodic evaluations are viewed as being closely inter-related rather than as separable entities. While some of the suggestions may be impractical or logistically impossible to immediately implement, they may provide ideas for future development within the State Police Trooper system.

#### II. Test-Job Relating Methodology

Hubbard, et al: (1) have recently suggested procedural steps that can be followed to efficiently define demonstrably job-related strength and agility tests. The steps include: (a) task identification; (b) rating of tasks for strength and agility factors; (c) review of possible tests to be recommended; (d) preliminary try-out and choice of the battery of tests; and (e) preparation of a job-relatedness analysis of the recommended tests. These procedural steps were essentially followed in the formulation of the recommended physical performance test included in this report.

Compliance with the first procedural step, task identification, was met through task record and performance dimension rating questionnaires (2) administered to incumbent Michigan State Police Troopers by the Department of Civil Service, Bureau of Selection. Job tasks and performance dimensions listed on the questionnaires were generated from a state-wide sample of 200 position descriptions, direct observations of patrol shifts, a study of published job analyses from other police jurisdictions, and meetings between Bureau of Selection and field representatives of the MDSP. A total of 269 job tasks and 199 performance dimensions (knowledges, skills, abilities, and personal characteristics) were ultimately included on the questionnaires.

The second procedural step was adhered to by selecting out the job tasks and performance dimensions that contained a reasonable requirement of physical strength, agility and endurance. The selected items are listed in Tables 1 and 2. Except for item 68, where a and b are used to distinguish between task and dimension, the item numbers in the first column and descriptions in the second column are identical to those used in the questionnaires. A detailed review of these selected items indicates that State Troopers perform a wide variety of physically related tasks in the performance of their jobs. Furthermore, it seems clear that while these tasks can be easily identified as having a significant physical performance component, the exact nature of the component can be variable in terms of essential combinations of strength, endurance, agility and flexibility.

Tables 1 and 2 contain much other valuable data in the form of frequency, importance and need ratings for the selected job tasks. One could argue that although a job task clearly requires a given level of physical performance capability it is questionable whether it should be considered in the development of a job-related performance test if the task is performed only infrequently or receives a low importance rating by troopers who are "on the job." In the task record questionnaires, State Police Troopers were presented with 269 task descriptions and asked to indicate how frequently they performed each task (times per week, month and year) and how important they felt effective performance of each task was to overall job success. In the performance dimension questionnaire they were presented with short statements of 199 knowledges, skills and abilities that may be required on the job and were requested to evaluate each dimension in terms of its importance (very high = 7 to very low = 1) to overall job success, the relative importance of possessing each dimension at entry (essential = 3, not useful = 1) and when each dimension is typically acquired (prior to entry = 1, 09 level = 4). These data were extremely useful and are presented in respective columns of the tables.

The starting point for judging the relevance of each selected task and dimension item was to define arbitrary cut-off points for the mean responses. For example, when rating scales of 1-7 were used (task and dimension importance) the arbitrary cut-off was set at 5.0 and mean responses less than this level were seen as non-important. Where a 3-1 scale was used (need at entry) the cut-off was set at means greater than 2.5. Where a 1-5 scale was used (when acquired) a cut-off of values greater than 1.5 was employed. Using the above criterion, nearly all of the tasks previously selected as having a significant physical performance aspect were rated as important by the troopers. Two exceptions were tasks #34 which had to do with foot patrols during emergencies, disasters and social functions and #44 having to do with mechanical assistance

to stalled motorists. Interestingly, even though the average annual frequency of doing some tasks was very low, the troopers still viewed them as important to the performance of their job. Examples were tasks #88 (riot control), #138 (swim-lifesaving) and #179 (disarming person with weapon). In view of this, the rating of importance of swimming ability (PD #72) is somewhat confounding since it was not rated highly enough to meet the importance cut-off criterion.

Two noteworthy observations from the need-at-entry ratings were that performance dimensions #35 (knowledge of force to apply) and #74 (physical control methods) were rated considerably lower than any of the other dimensions. This likely indicates that troopers feel these techniques are learned during their academy training. This interpretation is supported by relatively "late" ratings to the question of when these dimensions and capabilities are acquired. The second interesting pattern is the ratings given for physical capabilities #68b, 69, 70 and 71. These relate to basic running ability, physical reflexes and reactions, manual dexterity and motor coordination. They were all rated as important capabilities which were considered nearly essential at entry and acquired prior to entry.

In summary, it was felt that the job-related physical needs of State Police Troopers were adequately identified and could be generally categorized into needs for strength to push, pull, drag and lift; for cardiorespiratory endurance to endure heavy work and running; and for abdominal strength and spine flexibility to avoid low back pain, problems of strains and loss of mobility and agility.

In addition, there appeared to be a need to continue swimming and lifesaving instruction and to expand programs of maintenance physical training coupled with periodic evaluations of physical performance capabilities to insure that minimal standards would be continuously met. These latter recommendations are included because of the high ratings the troopers gave to task #1 (performs physical exercise on a regular basis to maintain physical strength, agility and health) and #77 (willingness to keep proficient in physical skills and abilities).

### III. Recommended Physical Performance Tests

This section contains test items recommended for use in applicant screening evaluations and in physical performance evaluations made during and after completion of academy training as well as throughout the career of State Police Troopers. The test items were selected on the basis of their being job-related, i.e., that they discriminate between individuals possessing inadequate, minimal, or adequate levels of muscular strength, cardiorespiratory endurance, motor coordination and trunk flexibility to effectively carry out a variety of physical tasks while employed as a State Police Trooper. Four test items recommended for inclusion in initial screening evaluations of applicants include:

1. 100 lb. dummy drag-lift test
2. One-half mile shuttle run test
3. Bent-knee sit-up test
4. Seated stretch test

TABLE 1. Summary of Average Frequency (Weekly, Monthly & Yearly) and Importance Ratings For Selected Job Tasks i.e. Those Related To Needed Physical Capabilities. R = Number of Respondents. Questionnaire N = 376.

ITEM NO.	TASK DESCRIPTION	FREQUENCY-NO. OF TIMES						IMPORTANCE RATING	
		WEEKLY		MONTHLY		YEARLY		R	AVE.
		R	AVE.	R	AVE.	R	AVE.		
1	Performs physical exercise on a regular basis to maintain physical strength, agility & health.	376	2.8	103	10.2	71	76.5	374	5.6
18	Drives patrol car during normal and adverse weather conditions, at normal and high speeds, during daylight and darkness, and during emergency situations, to perform police duties to minimize the opportunity for persons to commit crimes and to discourage traffic law violations.	376	10.6	48	29.5	38	87.4	361	6.2
34	Patrols, on foot, in emergency and non-emergency situations, in all types of weather to provide security of property and persons at special social functions, fairs, disaster and civil disorder areas, and labor disputes.	376	0.7	50	3.7	205	7.9	316	4.4
44	Attaches jumper cables to battery to start vehicle, extinguishes vehicle fires, changes tires,	376	1.2	185	6.3	89	37.5	370	4.2

(continued)

TABLE 1. (continued)

ITEM NO.	TASK DESCRIPTION	FREQUENCY-NO. OF TIMES						IMPORTANCE RATING	
		WEEKLY		MONTHLY		YEARLY		R	AVE.
		R	AVE.	R	AVE.	R	AVE.		
68a	transfers gasoline, etc., to assist motorists.  Removes and/or arranges for the removal of hazards by removing wrecked or disabled vehicles, cleaning roadway of debris, etc., to prevent accident and/or injury to persons.	376	1.2	86	5.6	111	31.0	360	5.2
88	Stands and/or marches in ranks or formations, or stands at fixed points in riot situations and during civil disorder, and confronts numerically superior groups of agitated people, to deter them from destroying property and causing injury to persons; possible using tear gas guns, gas masks, riot gear such as helmets and batons with special techniques learned in recruit school in order to preserve and protect life and property.	376	0.0	7	1.0	186	1.5	308	5.9
95	Participates in search parties, in rural and urban areas, in all weather conditions, daylight or night time, following a designated plan, to locate missing persons, lost	376	0.0	26	1.6	254	3.0	329	5.6

(continued)

TABLE 1. (continued)

ITEM NO.	TASK DESCRIPTION	FREQUENCY-NO. OF TIMES						IMPORTANCE RATING	
		WEEKLY		MONTHLY		YEARLY		R	AVE.
		R	AVE.	R	AVE.	R	AVE.		
	hunters, and/or children, etc., as quickly as possible.								
110	Moves and/or supervises the movement of injured persons, including removing injured person from automobile, to insure that proper carrying and transporting techniques are used to prevent aggravation of the injury.	376	0.4	152	2.8	153	14.2	361	6.5
111	Uses emergency equipment and tools at accident scenes, to extricate and remove persons trapped in the wreckage.	376	0.1	51	1.9	242	4.5	332	6.3
138	Dives into and swims in lakes, ponds, streams, rivers, and other bodies of water to perform life saving measures.	376	0.0	2	1.0	44	1.4	212	6.0
163	Participates in raiding parties; and when necessary smashes doors, climbs through windows, and chips through walls or roofs to gain entry to buildings to obtain evidence for prosecution of gambling and drug law violations.	376	0.0	12	1.8	205	2.2	303	5.5

(continued)

TABLE 1. (continued)

ITEM NO.	TASK DESCRIPTION	FREQUENCY-NO. OF TIMES						IMPORTANCE RATING	
		WEEKLY		MONTHLY		YEARLY		R	AVE.
		R	AVE.	R	AVE.	R	AVE.	R	AVE.
179	Physically takes weapon from armed person to prevent injury or death to self or other persons in immediate area.	376	0.0	9	1.6	159	2.9	292	6.7
180	Chases violators on foot to apprehend and arrest them for criminal and traffic law violations.	376	0.1	41	2.1	262	4.0	343	6.1
181	Physically subdues person and applies handcuffs to prevent injury to self and other officers or persons and to take subject into custody; places subject in patrol car in a position to prevent escape and insure safety to the officer.	376	0.5	135	3.5	185	14.6	361	6.5



TABLE 2. Summary of Average Ratings of Importance, Need at Entry and When Typically Acquired for Selected Job Dimensions Requiring Physical Capabilities. Questionnaire N = 475.

ITEM NO.	PERFORMANCE DIMENSION DESCRIPTION	IMPORTANCE	NEED AT ENTRY	WHEN ACQUIRED
		7 VERY HIGH 1 VERY LOW	3 ESSENTIAL 1 NOT USEFUL	1 PRIOR TO ENTRY 4 AFTER 09 LEVEL
35	Ability to determine amount of physical force to be used.	6.2	1.6	2.7
64	Knowledge of own personal limits (own limitations).	6.1	2.3	1.8
66	Ability to present a physical presence of height, size and bearing, etc., that indicates capability to take care of self.	6.4	2.6	1.3
67	Ability to push (e.g., cars off the road); to pull (e.g. bodies out of accidents); to drag e.g. logs from the road); to lift.	5.5	2.3	1.6
68b	Ability to run.	5.4	2.3	1.4
69	Good physical reflexes.	6.2	2.6	1.2
70	Manual dexterity.	5.8	2.5	1.2
71	Motor coordination	6.0	2.6	1.2
72	Ability to swim.	4.6	2.0	1.5

(continued)

TABLE 2. (continued)

ITEM NO.	PERFORMANCE DIMENSION DESCRIPTION	IMPORTANCE 7 VERY HIGH 1 VERY LOW	NEED AT ENTRY 3 ESSENTIAL 1 NOT USEFUL	WHEN ACQUIRED 1 PRIOR TO ENTRY 4 AFTER O9 LEVEL
73	Ability to physically defend themselves and others.	6.5	2.1	1.7
74	Ability to apply physical control methods; e.g., take-downs, come alongs.	5.7	1.5	2.0
75	Ability to endure physically long periods of driving, standing.	5.7	1.9	2.4
76	Ability to endure a period of heavy physical activity without exhaustion.	5.5	2.1	1.8
77	Willingness to keep proficient in physical skills and abilities.	5.7	2.1	2.0

Five test items recommended for evaluation of cadets prior to, during, and after academy training and for the periodic evaluation of troopers include:

1. Push-up test
2. Chin-up test
3. One-mile continuous run test
4. Bent-knee sit-up test
5. Seated stretch test

A description of each test item, test conditions, and administrative guidelines is given below. The goal here is to adequately describe and define each test item so that it can be administered in a manner that insures valid, reliable and objective measurements.

The test items can best be administered to large groups by establishing test stations for each item and assigning a portion of the total group to each station. A rotation pattern can be established so applicants move smoothly from a completed station to await testing at the next station in sequence. This approach works well if the time required for testing at each station is similar (avoids bottle-neck effect), if the regions of the body or variable measured by the items are different (avoids localized fatigue effect) and if the test item that is most generally fatiguing is run individually or by groups as the final test item (avoids general residual fatigue effect). Applicants should be encouraged to warm-up immediately before beginning the tests. This can be handled most efficiently by providing a leader who demonstrates warm-up and stretching calisthenics to the entire group. These activities should be the type that promote general "loosening-up" and should not be strenuous in intensity, e.g., head rolling, arm circles, shoulder shrugs, toe touching, windmill, waist bending, jumping-jacks, hurdler-stretch, seated stretch, run in place, etc. It is usually advisable to allow 2-3 minutes for applicants to perform exercises they may be accustomed to doing in preparation for sports performance. The entire warm-up period should not exceed 10 minutes. At the conclusion of the warm-up session the exercise leader should demonstrate proper performance of each test item and verbalize the criteria that will be followed in scoring each successful performance. The running events will not be demonstrated but administrative details will be explained so as to expedite continuity and avoid later confusion.

For the screening and periodic evaluation tests outlined below it is recommended that test stations be set up for all items, that groups be assigned to the strength and flexibility stations and that running tests be conducted last. If running tests are individually conducted, the first persons to complete all other tests should be the first to run. If run tests are conducted on groups, this test variable is less important because it has less negative psychological impact on the persons being tested. Personnel working as station administrators and scorers should receive their assignments, be apprised of their responsibilities and be provided with all needed equipment (stopwatches, clipboards, score cards, etc.) well in advance so tests can be administered in an organized manner. This test environment is essential to communicating to those being tested that the test personnel know what they are doing, that tests are being conducted objectively and reliably and that they are being treated fairly. Back-up systems for timing and counting (two

stopwatches started simultaneously, two people counting) are advised particularly where fatigue would make it difficult to retest individuals soon after they had partially or fully completed a trial where measurement errors became apparent.

#### A. Screening Evaluations

This section contains a description of test items to be used in evaluating applicants with the primary objective of detecting extreme weaknesses in overall physical strength, cardiorespiratory endurance and trunk flexibility. For this reason, performance on each item would be evaluated on a pass-fail basis and applicants would have to successfully pass all test items to merit further consideration. Applicants would, therefore, be advised to complete all test items and individual performances for each item would be recorded in units of repetitions, performance times or distances. This would allow applicants to localize the sources of their failures as well as to identify their strengths. Those failing test items would be advised that they might elect to begin training to correct their specific weaknesses and then apply for retesting. The rationale for screening-out applicants by this procedure is that it is unlikely that applicants who fail test items can safely or adequately participate in the physical training aspects of the recruit school. Further, if they lack basic initial physical capabilities and cannot fully participate, it is unlikely that they will be able to acquire the strength, endurance and skills needed to pass tests with even higher standards at the completion of recruit school or the probationary period.

1. 100 lb. Dummy Drag-Lift Test - Applicant will drag a 100 lb. dummy a distance of 15 feet across a standard floor surface, lift-drag the dummy onto and across a standard surface platform 16 inches high and 4 feet long, back onto and across the floor for a distance of 5 feet and then lift and place the dummy on a table 26 inches high. This is to be done using continuous effort without stopping to rest and must be completed within 45 seconds. Scoring is on a pass-fail basis. Applicants will be advised on proper lifting techniques (straight back, bent knees) to avoid back strain. The dummy will have either a center strap and one handle at an end or two end handles (these details to be worked out in pilot studies). Applicants will be dressed in gym clothing such as shorts, sweat-suits, etc., and will wear rubber soled athletic shoes of their choice. They will be allowed to grasp the dummy in any manner they desire but will be advised on the procedure that is biomechanically most sound (allows for best leverage).
2. One-Half Mile Shuttle Run Test - Applicants will be dressed as previously described. They will assume a standing start position with both feet behind a starting line. After a "get-set" warning, they will be told to "start" running. The minimum acceptable level of performance for a one-half mile continuous (no walking or rest stops) shuttle run will be completion of the test in five minutes. Applicants will be cautioned about starting out at speeds that are too fast so that localized muscle fatigue or undue discomfort forces them to stop. They will be advised that keeping a steady pace is best for successful performance of the test and on how to determine if they are keeping a "minimal" pace by

referring to a large clock at the start-finish line. The minimal target pace will be dependent on the location of the test and available floor space. If conducted in a gym, the start line and shuttle standard may be 100 feet apart. In that case, applicants would run about 25 complete shuttle laps at a minimal pace of approximately 12 seconds/lap to finish the one-half mile distance in a time of 5 minutes. Runners will be cautioned about allowing adequate space to slow up when rounding the shuttle standards so as not to lose their balance but they will not be allowed to grab the standard.

3. Bent-Knee Sit-Up Test - Applicants will be dressed as previously described. They will position themselves on the floor in a seated position and place the toes of both feet under a restraining device (stall bars, heavy bench cross supports, etc.). Keeping their knees bent at an angle of 90° or less, they will lie back on the floor and interlace their fingers behind their heads (hands locked). The objective will be to perform as many sit-ups as possible in a 60 second period with no more than 3 seconds rest between the completion of one sit-up and the start of the next. To be counted, a sit-up must be fully completed with the applicant retaining the feet, knee and hand positions throughout and by sitting up so both elbows touch the knees simultaneously and then returning to the floor so that both shoulders touch the floor. This test will be scored on a pass-fail basis with fewer than 20 completed sit-ups in 60 seconds considered a failing performance.
4. Seated Stretch Test - Applicants will be dressed as before but remove shoes. They will seat themselves on the floor and slide forward as far as possible against a vertical limit stop (groin). The vertical stop will align with the zero cm mark of a meter stick extending at right angles to it (in line with outstretched legs). With legs together and knees straight, the applicant stretches forward as far as possible. Applicants will fail this test if they cannot extend their fingertips to a point within 8 inches of the total distance from the groin stop to a point on the meter stick that corresponds to a vertical alignment with the heels (feet held in normal flexed position).

#### B. Periodic Evaluations

This section contains a description of test items to be included in the physical performance evaluation of recruits on their initial entry into recruit school, at three-week intervals thereafter and at completion of basic training. It is recommended that this test also be administered at completion of the probationary period and annually thereafter. Since minimal as well as absolute performance on each test item is of interest, both should be noted. All recruits would be required to meet the minimal standards by the end of their probationary period but would be encouraged to perform to their maximum ability whenever the test was given. This will allow the generation of a physical performance profile score which could contain weighted as well as unweighted factors. Examples of weighted factors would be number of push-ups in 60 seconds, number of chin-ups possible, one-mile run time and number of sit-ups in 90 seconds. Unweighted factors might be success or failure in the stretch test, deviation (weight gain or loss) from ideal body weight and the individual's age.

Physical performance profile scores could be used in a number of meaningful ways. They provide a means for evaluating the effectiveness of physical training procedures used in the academy through the identification of periods of individual or group progress, plateauing or regression. They can also be used as motivational tools during training since weaknesses are identified and progress is charted in addition to capitalizing on the competitive drives of recruits to "do their best" or "to be the best." An additional use for profile scores is to allow each trooper to continuously evaluate their own physical fitness levels. This can provide them with invaluable insight into the effects of aging and working at a relatively sedentary occupation in a food-rich society that is becoming more and more automated. Maintaining such records on a longitudinal basis could therefore sensitize and motivate troopers to work-out on a frequent basis. These records could also provide administrators and personnel managers with information about troopers that might have direct relevance to their "fitness" for duty or changes in their health status that warrants counseling, rehabilitation therapy or reassignment of duty. It is unfortunate that in many work settings better protective maintenance and performance efficiency data are logged for the machines used by workers than for the workers themselves.

1. Push-Up Test - Cadets and troopers will be dressed in gym clothes and gym shoes. They will begin in a down push-up position with only toes, hands and chest in contact with the floor. They will perform as many push-ups as possible in a 60 second time period. To be counted, the push-ups must be properly executed in that the entire body must be raised and lowered as a rigid inflexible unit without sagging or arching of the back or neck and without undue elevation of the buttocks. The arms must be fully extended to a straight "locked" position at the top of the push-up and the chest must contact the floor on return to the down position. A minimum acceptable level of performance would be 15 push-ups in the 60 second time period. The push-ups are to be done in a continuous manner and if rest is needed it can only be taken in the up position, i.e., push-up is not counted as complete until a return to the down position is made. Those tested would be encouraged to do as many push-ups as possible in 60 seconds and this number would be recorded.
2. Chin-Up Test - Cadets and troopers will be dressed in gym clothing and gym shoes. They will stand on a platform enabling them to reach a horizontal bar. The bar will be 1 1/2 to 2 inches in diameter and positioned so that the feet of even tall persons do not touch the floor when they hang from the bar. The bar should be rigid and strong so as to support the weight of the heaviest individuals to be tested without undue spring or sag. Individuals being tested perform as many chin-ups as possible in a continuous manner, i.e., can't stop to rest and must continue holding onto the bar throughout the test. To be counted, a chin-up (palms toward grip) must be completed from a down position with arms fully extended to an up position where the chin is brought above the level of the bar. This must be accomplished without undue swinging of the body and without flexing at the hip in a kip action. The chin-up is counted at the top position. A minimum acceptable level of performance would be 5 chin-ups completed as described. Those tested

would be encouraged to do as many continuous chin-ups as possible and this number would be recorded.

3. One-Mile Continuous Run Test - Cadets and troopers will be dressed in gym clothing and gym shoes. This test could best be conducted on an indoor or outdoor running track varying in length from 1/10 to 1/4 mile/lap. Persons tested will begin behind a start line in a standing start position. After a "get set" signal, they will be instructed to "start" running a one-mile distance. The run is to be accomplished in a continuous manner without stops for rest or walking. A stopwatch will be started on the start signal. A minimum acceptable performance on this test would be to complete the one-mile distance in less than 9 minutes. Those tested would be encouraged to complete the one-mile distance as fast as possible and the actual time for completing the test would be recorded in minutes and seconds.
4. Bent-Knee Sit-Up Test - As described for the screening test but with emphasis on the actual number of sit-ups completed in 90 seconds. The minimum acceptable level of performance is raised to 30 sit-ups/90 seconds. Those tested would be encouraged to complete as many sit-ups as possible in 90 seconds and this number would be recorded.
5. Seated Stretch Test - As described for the screening test but with actual distances recorded and emphasized. The minimum acceptable performance level would be fingertip extension to within 6 inches of the total distance from groin stop to vertical heel alignment point.

Table 3 contains a summary of the minimum acceptable levels of performance on each test item. Both entry minimums and performance minimums are shown. It is clear that there are only six different test items with sit-ups and seated stretch common to both screening and performance evaluations. Consideration might be given to also including the 100 lb. drag-lift test in the performance battery. If this were done, the 1/2-mile shuttle run would be the only non-common test item, but one which is covered by the one-mile run since they both provide a measure of cardiorespiratory endurance.

TABLE 3. Summary of Minimum Acceptable Levels of Performance

<u>Test Item</u>	<u>Entry Minimum</u>	<u>Performance Minimum</u>
100 lb. drag-lift	Complete in 45 sec.	NA
1/2 Mile shuttle run	Complete in 5 min.	NA
Bent-knee sit-ups	Complete 20 in 60 sec.	Complete 30 in 90 sec.
Seated stretch	Within 8" of heel	Within 6" of heel
Push-ups	NA	Complete 15 in 60 sec.
Chin-ups	NA	Complete 5
1 Mile run	NA	Complete in 9 min.

IV. Rationale and Justification for Test Items

Procedural step number 5 in Hubbard's scheme for identifying job-related strength and agility tests calls for preparation of a job-relatedness analysis of the recommended tests. This step is met in Table 4 which summarizes the

relationships between recommended test tasks and job tasks and the similarity between the physical capabilities needed for effective performance of the job and those measured by the physical performance test battery. An abbreviated form of job task and performance dimension descriptions are given at the bottom of the table for easy reference. The reader is referred back to Tables 1 and 2 for complete descriptive statements.

A close review of Table 4 would indicate that nearly all job task and performance dimension statements can be related to the seven test task items. No attempt was made to relate test tasks to job tasks #34 (patrols on foot) and #44 (mechanic assistance to motorists) because of the low importance rating these descriptions were given by questionnaire respondents. There was also no attempt made to relate test tasks to job task #138 or performance dimension #72 since these have to do with swimming and life-saving measures and none of the test items evaluate these abilities. Performance dimension #35, the ability to determine amount of physical force to apply, was not included because of its low need-at-entry ranking and indications that troopers thought this ability was learned during academy training or their probationary period.

The omission of performance dimensions #69 (good physical reflexes), #70 (manual dexterity) and #71 (motor coordination) requires some special comment. To begin, these capabilities all received high importance ratings and were judged as nearly essential to possess at entry and as being acquired prior to entry. These response ratings may simply reflect a general appreciation for the fact that such basic characteristics are inherent with developmental modification occurring early in life. This dictates that meaningful tests of such measures should be conducted prior to selection of academy training to screen-out those applicants who have deficiencies in basic motor coordination. Since these tests usually require sophisticated test equipment, necessitate the application of rather arbitrary normative guidelines, and make little allowance for compensatory adjustments on the part of the performer, it is recommended that they not be initially included in the test battery. Gross deficiencies in motor coordination will be obvious during the performance of the 100 lb. drag-lift and 1/2 mile shuttle run test and these should be noted. If subsequent evaluations were made, it would be important to test motor responses rather than reflexes since even some athletes lack good reflexes as tested in the usual manner but are extremely skilled performers.

A number of physical agility tests used by other police jurisdictions were reviewed during the course of selecting test items for inclusion in the recommended test batteries of this report. Some of these tests have been previously reviewed and summarized by McGhee (3). It should be clear that if test items used by others were not selected it was because we did not feel they met the criterion of measuring job-related physical needs, because there was duplication of measurement or that a greater or lesser requirement for a given type of test seemed more reasonable.

The Santa Ana (4) physical performance test included the following test items: chins (or pull-ups), bent knee sit-ups, grip strength test and 15 minute run. Push-ups were eliminated because it was felt that the relationship between push-ups and pull-ups was such that both tests tend to measure similar physical traits. However, it has been reported by Morford (5) that the intercorrelation between these particular tests is usually only about r = 0.58. Upon

TABLE 4. Summary of Relationships Between Recommended Test Tasks and Job Tasks or Performance Dimensions.

TEST TASK	RELATED JOB TASKS (JT) OR PERFORMANCE DIMENSIONS (PD)	TEST TASK AND BASIS FOR SIMILARITY BETWEEN RELATED JOB TASKS OR PERFORMANCE DIMENSIONS
100 lb. drag-lift	JT#68a Ability to drag, lift, JT#110 move injured, use tools. JT#111 JT#163 JT#181 PD#67 PD#73	Tests strength of major muscle groups used in dragging and lifting including elbow flexors, and extensors of the back, trunk and knee. Important to applying whole body force.
Push-ups	JT#111 Ability to push objects JT#163 and apply leverage. JT#179 PD#67 PD#73 PD#74	Tests strength of shoulder and arm muscle groups used in pushing objects and applying leverage in disarming or using takedown and control methods. Shoulder flexors and arm extensors.
Chin-ups	JT#111 Ability to pull objects JT#163 and apply leverage. JT#179 PD#67 PD#73 PD#74	Tests strength of shoulder and arm muscle groups used in pulling objects and applying leverage in disarming or using takedown and control methods. Shoulder extensors and arm flexors.
½ Mile shuttle run	JT#95 Ability to run and endure JT#180 periods of heavy physical PD#68 work. PD#76	Tests cardiorespiratory endurance and endurance of leg muscles used in chasing violators on foot; also ability to endure periods of heavy work without exhaustion such as searching in unfavorable areas.

(continued)

TABLE 4. (continued)

TEST TASK	RELATED JOB TASKS (JT) OR PERFORMANCE DIMENSIONS (PD)	TEST TASK AND BASIS FOR SIMILARITY BETWEEN RELATED JOB TASKS OR PERFORMANCE DIMENSIONS
1 Mile run	JT#1 As above for ½ mile run JT#180 but also maintenance of PD#64 physical vigor, health, PD#66 and appearance. PD#68b PD#76 PD#77	As above for ½ mile run but also tests for improvement, maintenance or loss of general physical fitness frequently with accompanying changes in body weight, gains in body fat, and muscle atrophy.
Bent-knee sit-up	JT#1 Ability to endure long JT#18 periods of standing, JT#88 driving or marching. PD#75	Tests the strength of abdominal muscles important to performance of trunk movements but also to avoiding lower-back pain episodes during long periods of driving on patrol, standing and/or marching during riot control.
Seated stretch	JT#1 As above but also to JT#18 retain back flexibility JT#88 needed for good motor PD#75 coordination, reactions and agility.	As above but also tests for loss of spinal flexibility (rigidity) and tightness of muscle groups (hamstrings) Spinal flexibility important to proper initiation and completion of arrest procedures and overall general performance of duties.

JOB TASK (JT) ABBREVIATED DESCRIPTION

PERFORMANCE DIMENSION (PD) ABBREVIATED DESCRIPTION

1 works-out regularly	110 moves injured	35 apply proper force	71 motor coordination
18 drives patrol car	111 uses emergency tools	64 know ability limits	72 ability to swim
34 patrols on foot	138 lifesaving in water	66 present good image	73 defend themselves
44 mechanic assistance	163 raiding parties	67 push, pull, drag, lift	74 perform takedowns
8a removes debris	179 disarms person	68b ability to run	75 endure driving, standing
88 standing, marching	180 chases violators	69 good physical reflexes	76 endure heavy work
95 search parties	181 subdues, cuffs person	70 manual dexterity	77 willing to maintain abilities.



squaring the coefficient it can be seen that 34% of the variance is held in common between the two tests, whereas 66% of the variance is considered specific to one or the other of the two tests. The suggested minimum passing scores were as follows: (1) Grip strength, as measured on a hand-grip dynamometer, for the total of left hand and right hand - 100 kilograms; (2) 30 bent-knee sit-ups; (3) 5 pull-ups (palms toward position); and (4) 1.5 miles completed in 15 minutes. Although it was believed that a distance of 1.75 miles for the 15 minute run would give a better indication of fitness, it was also felt that the elimination rate may be too high if that distance was employed as the minimum passing score. The King County (Seattle) Department of Public Safety (6) included in its report of job-related physical performance tasks a one-mile run and pull-ups, where a minimum of 5 pull-ups were required to pass the test. Several of the test items used by these jurisdictions were retained for use in our recommended test batteries. We have included a push-up test since it tests the strength of a group of muscles different from those tested by pull-ups and have not included a grip strength test since a measure of grip strength is inherent in the chin-up and 100 lb. drag-lift test items.

A test item we included that is not ordinarily found in physical agility tests is the seated stretch test. The main reason for including this item is the known prevalence of low back pain and loss of spinal flexibility common to persons working at sedentary occupations involving prolonged static contraction of back muscles during sitting (driving in the case of troopers). This, coupled with a loss of strength in the abdominal muscles, shortening of hamstring muscles and frequently a gain in abdominal adipose tissue, predisposes the individual to disabling episodes of low back pain and potential strains during even minimal exertion. Table 5 contains data derived from 1974 and 1975 Michigan State Police injury reports (7) that indicate that back strains and sprains and arm, neck and shoulder injuries account for approximately 55 to 70% of all injuries that cannot be related to motor vehicle accidents or other unfavorable circumstances.

TABLE 5. Summary of Reported Non-Accident Related Injuries to Michigan Police Troopers During 1974 and 1975.

Nature of Injury	1974 Summary		1975 Summary	
	Frequency	Percent	Frequency	Percent
Back strains/sprains	11	42.3	12	41.4
Arm, neck and shoulder injuries	7	26.9	4	13.8
Leg injuries	4	15.8	8	27.6
Muscle, ligament pulls	4	15.8	2	6.9
Hernias	-	--	3	10.3

N=26  $\bar{x}$  age = 29.6 yrs. N=29  $\bar{x}$  age = 27.7 yrs.

One can only speculate on the degree of severity of auto-accident related injuries as viewed in terms of the level of physical fitness of the victim. The numbers of officers who injure themselves while on the job and fail to report the injury is also unknown.

Since the mean age of the injured officers was about 28 years, it is especially felt that these injuries could have been avoided or significantly lessened if the individuals in question had maintained a higher level of physical fitness. Specific areas of weakness in physical fitness appear to be the strength of the abdominal muscles, shoulder girdle strength, and shoulder and lower back flexibility. The inclusion of the seated stretch test will provide valuable measures of flexibility while the sit-up, chin-up, and push-up test items will allow measurement of strength in critical body regions.

A 70 lb. sandbag manipulation carry was recently included in a new pass/fail test for California State Troopers (8). During the sandbag test performers are required to carry a 70 lb. sandbag while running a timed slalom course. They are also required to turn the bag 180 degrees in their arms both before and after the run. If all turning manipulations are performed correctly, their score is the elapsed time of the run. We elected to use a heavier bag and require lifting, pulling and dragging since these acts more closely approximate the job tasks performed by Michigan State Police Troopers.

V. Difficult Test Items for Women

The objective of this section is to evaluate the recommended tasks to identify those which would be more difficult for women than men and if necessary to recommend alternative tests of the same capabilities which would have a lesser adverse effect of screening-out women applicants. Finally, where alternative tests could not be recommended, consideration was to be given to reducing or dropping requirements if proper compensatory or alternative training were provided.

By way of introduction, we have not recommended any alternative tests for women applicants nor recommended any reduced or dropped requirements. Our approach has been to select test items judged to be demonstrably job-related and to set reasonable minimal standards that can be initially met or attained by applicants or troopers irrespective of age or sex. A second system of scoring allows for generation of a physical performance profile for each trooper based on a composite of maximum performance scores for each test item. In setting the minimal standards, which we acknowledge will be easily surpassed by many applicants and troopers of either sex, we have retained many of the current recommendations of those who have had experience in the matters of testing the physical capabilities of women applicants and in integrating women into police training schools.

We particularly endorse the following statements selected from a manual by Milton, et al., titled Women in Policing (9). Some of these statements have to do with training but seem reasonably applicable to considerations of required physical performance standards.

1. "To make fewer demands of women is to destroy the credibility of the integration effort and leave doubts about the women's ability to perform. This test, however, must be job-related and structured so as not to discriminate unfairly."



2. "If a department finds that its physical agility test is job-related, and if it finds that the test screens out many persons otherwise qualified, it might consider requiring candidates to pass the test at the completion of recruit training rather than at the start of training."
3. "What are the tasks for which this person is being trained? If a department intends to integrate women, deploying them interchangeably with men, then it should train its women for the same job for which it trains its men."
4. "Because it is the training process which imparts the skills necessary for success in the field, a program for total integration of women into police work may collapse through failure to provide equal training to recruits of both sexes."
5. "In order for women to break out of the limited roles to which they have been restricted, they must undergo the same training as their male counterparts and be subject to the same rigorous standards for successful completion of courses. These standards must be job-related, and individuals who cannot meet them must be dropped or required to repeat courses until they can. Without equal training no one can have confidence in the skills of a female officer."
6. "Nor will women be prepared either psychologically or physically to meet the demands of patrol work."

It is anticipated that women applicants will have the greatest difficulty in passing the 100 lb. drag-lift and bent-knee sit-up items of the screening evaluation. Some will lack the general overall strength to lift the 100 lb. dummy and some will lack needed abdominal strength to complete 20 sit-ups in 60 seconds. The push-up and chin-up tests will prove to be more difficult for women than for men as part of the periodic performance evaluation. Some women applicants who fail the drag-lift or sit-up test should reasonably be able to improve their overall strength in the four-month period they must wait before being retested. The push-up and chin-up tests were purposely not included as screening test items since the arm-shoulder strength of women is known to be less than that of men and this would introduce considerable selection bias. These same items were purposely included in the periodic appraisal tests since there is also good evidence that women can develop these needed strengths if they practice proper strength training techniques.

A study of four women recruits assigned to the Michigan Department of State Police 87th Recruit School provides some insight into the minimum improvement in chin-ups and modified push-ups that might be expected during 14 weeks of training (10). They ranged in age from 24-25 years, in height from 5'2" to 5'7" and in weight from 122-149 lbs. Weaker members of the group increased from 10 to 50 modified push-ups and from 0 to 2 chin-ups during the training period. Stronger members increased from 1 to 5, from 2 to 7, and from 4 to 8 on the chin-up test. It was concluded that chin-ups were the most difficult exercise of the calisthenics included in basic physical training and that after 10 weeks only one female recruit could satisfactorily complete the required seven repetitions. It should be noted that these results occurred in

a setting where no special overload training was provided to develop arm and shoulder flexion strength except for the calisthenics included in the training program. Even better results could be expected using optimum strength training techniques. A comprehensive study on the feasibility of employing women traffic officers is currently being conducted by the California Highway Patrol (8). An evaluation of their current physical performance tests was made and it was concluded that all aspects of the tests were not valid since few women could successfully complete a 15" vertical jump-reach test or two required pull-ups (palms away). In fact, college age women tested by the Physical Education consultant were only able to complete an average of 6/10 of one pull-up. A new job-related physical performance test was developed consisting of four pass/fail items including a half mile shuttle run in 5 minutes 30 seconds or less, 23 bent knee sit-ups, a 70 lb. sandbag manipulation carry and a combined grip strength of 50 kg. for both hands. Of 403 female candidates that took the new test 330 or 67% passed.

Further insight into the strength training potential for women recruits is also provided by the California study. Initially, the major difference in the performance of men and women at the Academy was in physical training. In their training program the women cadets performed the same physical training test that was administered to the male cadets. Each test consisted of pull-ups, push-ups, sit-ups, and the obstacle course. (A maximum score of 100% is possible in each test.) After the fourth week of training the women cadets scored very low, 35.6%, on the physical training tests. However, on each successive test, the female cadets showed significant improvement and by the 12th week of training the average score nearly doubled, to 70.7%. It is suggested that these scores could have been further improved if a progressive resistive exercise program utilizing weights and barbells was incorporated into the Academy physical training program. Gains in strength are known to proceed at a more rapid rate when training with weights than by simply training using calisthenics. The resistance offered by calisthenic exercises, particularly push-ups, is dependent upon body weight. Since the upper torso of most women affords a relatively low resistance to work against, strength gains in the musculature of the shoulders and arms will proceed at a slower rate.

A final area where women applicants and recruits may have initial difficulty is in endurance running. The four Michigan State Police Recruits mentioned previously were believed to have poorly conditioned leg muscles and difficulty in learning proper breathing methods. These initial problems were overcome and even the poorest runner usually exceeded the required distance scheduled for each week of training. In fact, all of the women tested completed a volunteer five-mile run during the thirteenth week of training and a record setting 10-mile run during the fourteenth week. Women recruits in the California study ran a timed 2 1/2 mile run toward the end of Academy training and completed the distance in 21 minutes 15 seconds compared to 19 minutes 50 seconds for men.

Since there are some similarities between the California Highway Patrol test and the recommended screening test of this report, some similar outcomes might be expected. For example, in California, 49% of all applicants failed to appear to take physical and written tests. A survey indicated that the most important reason for failure to compete in the exams was that the physical agility

test seemed too difficult. Interim findings on injuries may also prove predictive. In summary, women suffered more injuries, 17 vs. 7, during training with nearly all of the injuries being sprains and strains to the lower body.

A criticism that might be raised regarding the recommended tests are that they are essentially based on questionnaire responses from only male State Police Troopers. While this is personally not viewed as a serious limitation, devising a test which reflects physical tasks performed by male State Police Troopers may be questioned by females since their responses to questions of task frequency, job needs and perceptions of importance may prove to be different (when available) from those of males.

#### VI. Supplementary Material and Comments

In the course of reviewing materials for this report, many interrelated matters were thought through, read or noted. This supplementary section contains such materials. In many cases they are tangential to the report and proved difficult to integrate. It is hoped that they will be reviewed along with the report and be helpful during implementation of the proposed physical performance evaluation procedures.

Information contained in the State of Michigan announcement of an open competitive examination for State Police Trooper 07 dated August 30, 1971, that may be germane to this report includes:

1. all applicants must be between the ages of 21 and 30 years. Being this young places them in a low-risk category with respect to taking an initial graded exercise stress test with electro-cardiography (GXT-ECG) to the point of voluntary exhaustion.
2. previously stated height and weight standards for males were 5'9" in stocking feet and not less than 150 lbs. or more than \_\_\_ lbs. If retained, these standards may require modification.\*
3. if applicants are unsuccessful in any portion of the exam, they may make application again after an interval of four months from the written test date. This would allow a reasonable period of time to train and acquire needed strength to subsequently pass recommended physical performance screening tests.
4. the section on physical characteristics states that physical condition must be adequate for performance of the work as determined by an examining physician. This statement should indicate that a physical performance screening exam will be administered and that applicants must meet or exceed established minimum standards set for each test item to pass the overall exam.
5. application-acceptance-entry procedure includes a written exam given by the Department of Civil Service or through local Michigan State Police posts, followed by an "oral" appraisal held primarily in Lansing. Unweighted factors listed under the oral exam include a height and weight assessment and physical agility tests where potential applicants are

\*considering new height standards for American adults.

advised to prepare themselves to meet the following physical agility standards for men: (a) six bar chins (pull-ups), (b) standing broad-jump for a distance of six feet, six inches, and (c) twelve push-ups. The standards for women are: (a) standing broad-jump for a distance of five feet, seven inches, (b) twelve push-ups (from knees rather than toes) and (c) 15 bent-knee sit-ups in 45 seconds. This provides a record of the old exam items.

6. the names of applicants who meet all standards are listed and they await call to enter the training school. At entry, they must pass a physical examination including a blood test, urinalysis and chest x-ray. They then participate in academy training for 13 weeks with this time being counted toward a one-year probationary period in the Civil Service class SPT 07 followed by promotion to SPT 09. While in the training school they participate in physical training, personal combat and defensive tactics, swimming, and military marching techniques. While the procedural sequence given above seems basically sound, a number of recommendations in this report would require changes in the announcement. It is questionable whether all items listed under oral appraisal can be considered to be oral exams. Perhaps personal registration and appraisal would be more appropriate. The physical agility test measures more than agility and should be changed to physical performance screening test with descriptions of new test items and minimal acceptable levels of performance listed as before.

The physical exam that applicants must pass on entry to the school should include a maximum GXT-ECG test to identify applicants with impaired cardio-respiratory functions that may be apparent only during the performance of strenuous work. These tests could be contracted through a qualified stress-testing laboratory at a cost of about \$125 per test. If no facilities are immediately available in the Lansing area, recruits may have to travel to Ann Arbor or Detroit for tests.

An additional recommendation in this report is that a more comprehensive physical performance evaluation be made on entry to the training school, and on completion of training. Cadets who fail to meet any of the minimal performance standards on any of the job-related test items would be expected to continue training so as to fully acquire the needed strength, endurance, and flexibility during their probationary period.

The Michigan State Police Recruit Swimming Program was reviewed (11), judged to be good and it is recommended that it be continued. This recommendation is made knowing that the water life-saving techniques and swimming skills are used only infrequently in the job performance of a state trooper. The same can be said for many emergency procedures where the cruciality of competence is emphasized by knowledge that officers can never predict when such skills will be needed. In fact, one could argue that if the circumstances are life-threatening to both the officer and accident victim, and there is

little opportunity for on-the-job application of life-saving techniques, then the techniques should both be taught well and reviewed frequently in practice sessions. This logic may have contributed to the high importance rating given for job task description #138 (swim - life-saving) even though the frequency of performing such tasks on the job was very low.

A summary of resignations from the 83rd through the 89th Recruit School indicates that of 17 recruits who resigned, 14 stated fear of water or difficulty with learning to swim as the primary or secondary reason. The remaining 3, one of whom was a woman, stated that poor physical condition or an inability to perform in boxing and self-defense were the principal reasons for their resignations.

The goals of the physical conditioning program are outlined in introductory statements from the recruit school material titled Department of State Police - Goals of the Physical Conditioning Program (12) dated 8/75. In this document, it is stated that there are three basic objectives of the physical conditioning program. They are: 1. to develop in the recruit a state of mental and physical alertness and proficiency which will enable the recruit to perform the more strenuous police tasks, 2. to permit the recruit to attain the physical condition necessary to participate effectively and safely in the holds and releases and defensive tactics which are a portion of the physical training program and, 3. to promote better present and future health and a well-defined and sharp appearance of State Police officers in uniform. It is also stated that a definite prerequisite for the successful completion of this program is that each applicant start the Recruit School in sound physical condition, being able to perform at the initial exercise level. The applicant's future success in the Recruit School physical training program is directly contingent upon the applicant extending maximum effort in each succeeding week's physical training program throughout the Recruit School.

Information included in the training division recruit training manual (13) dated January, 1975 having some relevance to this report is as follows:

1. A preface statement on "A Philosophy of Training" that includes physical soundness as one objective of the basic training program and indicates that physical training areas emphasizing activities designed to test the general physical condition, agility, endurance, and the psychological effects of such strains on the individual will be included. Also that few recruits are superior in every phase of the training program, but that standards have been established which are attainable. Candidates will also be individually and continually evaluated by members of the training staff, using standardized criteria and measuring devices. These statements would require little modification.
2. Section 7 of curriculum (pg. F3) indicates the inclusion of military and physical training while sections 10a and 10f indicate that calisthenics and physical examination will be included as aspects of the curriculum to be pursued during "extra-curricular" hours. Calisthenics are also listed for 5:45 a.m. in the daily time schedule (pg. G1). These sections would require little modification.

3. Section A4 (pg. K1) indicates that repeated sub-standard physical performance is grounds for dismissal. This section states that at the conclusion of three full weeks of the Recruit School, all recruit personnel are expected to be able to meet the requirements of the physical training program set for this point in the school. If upon evaluation, any recruit is not able to meet these minimum requirements, he is subject to dismissal from the school. Thereafter, all recruits are expected to keep pace with the physical training program throughout the duration of the program and any recruits who are unable to do so are subject to dismissal. The general tenor of these statements is consistent with proposed evaluation procedures but would need to be expanded in concept to include troopers of all ages and years of service as well as recruits.

In a separate outline titled Guidance Sheet for the Physical Fitness Program, officers are cautioned by the statement that it is recommended that a medical check-up precede the implementation of this conditioning program, particularly if you have been relatively inactive for a considerable period of time or have had a recent illness.

On the subject of height requirements which has been a sensitive issue, the following from the California Report (7) is relevant: Several municipal police agencies have set a minimum height requirement of 5'9" for entry into their police departments. This minimum height requirement is primarily based on the average height of adult males. The California Highway Patrol (CHP) has adopted a minimum height standard of 5'8" for male candidates and 5'6" for female candidates seeking entry into the CHP. In March, 1973, the Law Enforcement Assistance Administration stated, "that in absence of existing concrete data we cannot in good conscience arbitrarily suggest the abandonment of height standards and thereby possibly jeopardize the safety of police officers in this department." Later that year, in the landmark court case, Smith vs. the City of East Cleveland, the court concluded that there is no supportive evidence or job-related reason for a minimum height and weight requirement and further concluded "that the requirements are based solely on the stereotype of the male police officer." Since that time, the police department of the City of New York has dropped height requirements and in the District of Columbia, the requirement has been changed to five feet as a minimum for both men and women.

A height requirement of five feet seven inches excludes nearly 95 percent of American women and 45 percent of American men from being considered for police work. In the District of Columbia, the requirement has been changed to five feet as a minimum for both men and women, on grounds that any person must be that tall in order to drive a car safely. (9).

The following quotations are taken out of context from the manual Women in Policing by Milton et al, (9).

1. "Many departments which employ physical agility tests as selection criteria report that such tests screen out proportionately more female than male candidates. The Los Angeles department, for instance, found that while a higher percentage of women passed the written examination, psychological examination and background check, and that while approximately the same percentage of men and women passed the oral examination and medical examination, a significantly smaller percentage of women

passed the physical agility test. In its survey the department found that only 23.5 percent of women passed the agility test compared to 96.4 percent of the men. A department faced with this result should reassess its test to insure that it is job-related. One method used to devise the test is to make it reflect the various physical tasks carried out by police officers over a period of time. The test is based on the physical feats male officers perform in the course of duty, and it assumes that the ability to perform such feats is required of all officers."

2. "Unfortunately, employers, both public and private, have generally failed to validate their tests and standards. In essence, validation means determining that a test or criterion for entry has a demonstrable relationship to performance. The most important requirement in the guidelines is that there be empirical data demonstrating that the test is predictive of or significantly correlated with important elements of work behavior which comprise or are relevant to the job or jobs for which candidates are being evaluated. The guidelines prefer predictive studies (the administering of tests to a group of applicants and then comparing test results with subsequent performance) in contrast to concurrent validation studies (the comparing of test results with the performance of current employees)."
3. "It may be that skill in interpersonal relationships may be as important as physical fitness in equipping the officer to cope with potentially dangerous situations."
4. "Unlike the current selection systems of most police departments, where failure in any part of the selection process precludes entry altogether, such a total review would enable an individual to compensate for deficiencies in one area with strengths in another."
5. "As departments all over the country grapple with the problem of developing job-related physical standards, it appears that brute strength is not as crucial to performance as many have assumed. Current research suggests that leverage strength is what is required. The court pointed out that leverage strength was something that could be learned and that the only prerequisite was general physical fitness."
6. "It is then the responsibility of training programs to bring recruits up to minimum performance standards. With regard to female recruits, a department must consider the implications of such matters as equal or differential training, integrated or segregated training, the various approaches to physical training, the relevance of field training, the need for supplemental and optional training, the retraining of veteran women police officers, the desirability of having women in positions of authority and, finally, the effect of instructor and recruit attitudes."
7. "One possibility is to provide optional or supplemental training for those who either need or want it. The area most frequently considered for optional or supplemental work is physical training, especially unarmed self-defense. In addition, periodic in-service follow-ups are essential to keep self-defense skills intact."

8. "The most common problems involve physical training. Female instructors answer by pointing out that since women generally do not have the athletic background of most men they must be realistic and try harder than men to get into good physical shape."
9. "Expanding the selection process to include the training and probation periods has been suggested as the most viable means of insuring qualified officers, regardless of sex, and effective policing, regardless of jurisdiction. Further, departments should assess current qualifications to identify those which are truly minimum qualifications for entry, those which should be required only after academy training and those which can be compensated for with special skills."
10. "The absence of required physical agility maintenance programs poses another challenge to the use of such tests as entry standards since officers, once hired, are usually not required to maintain the same level of physical fitness demanded at entry."
11. "Finally, maintenance of physical fitness must extend beyond the training period if a case is to be made that it is truly necessary for the job. Such statements highlight the importance of in-service follow-up training and call into question current entry-level physical standards."

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**END**