SECTION B

PROJECT WORK TASKS

The construct/criterion validation process confirmed that physical fitness variables are the underlying constructs (factor) that are predictive of job-task performance. The validation study design consisted of eight basic tasks.

1. Existing data and program review
2. Physical job-task analysis
3. Job-task simulation test definition
4. Fitness Coordinator training
5. Evaluation testing
6. Data analysis
7. Judgment process
8. Standards implementation recommendations

TASK 1.0 EXISTING DATA AND PROGRAM REVIEW

The purpose of this task was to ascertain from existing data, critical physical performance and health areas required of sworn officers from the 19 participating URMMA agencies. An initial planning meeting was held with representatives of the 19 agencies on October 15-17, 1998 in Salt Lake City, Ut.to organize the organizational process for project implementation and data collection. There were five sub-tasks.

1.1 **Review of existing job definition information.** We reviewed job descriptions for each agency.

1.2 **Review of current and past fitness testing.** We reviewed test batteries and standards previously applied to officers.

1.3 **Program review.** Recruit and in-service fitness programs and basic training physical demands (policy, procedures, records, and curriculum review) were reviewed.

1.4 **Use of force critical incident review**. Critical incident records from the 19 agencies were reviewed for physical performance implications.

1.5 **Injury/absenteeism review.** Records were reviewed to ascertain any injury/absenteeism trends in which underlying fitness factors could be predisposing variables.

TASK 2.0 PHYSICAL JOB-TASK ANALYSIS

We conducted a focused physical job-task analysis. Thomas and Means staff has successfully applied a job rating process in the past that uniquely measures incumbentsôassessment of the underlying physical fitness and physical performance capabilities necessary for rated job-tasks.

RATING TASKS Sub-tasks 2.1 through 2.4 employed a rating group of existing police officers representative of the 19 agencies. An officer sample was selected from each agency to provide the ratings for physical job-task requirements, job conditions, and physical ability and fitness status necessary for their respective job classifications. The smaller agencies had all officers fill out the rating information while only a sample was selected from larger agencies (those samples were stratified and randomly selected by age and gender for each of the 19 agencies) A total of 289 officers completed the rating process. This group functioned as subject matter experts. A Job Rating Booklet was forwarded to incumbents who performed the rating. Besides the rating functions, this group also functioned as a focused subject matter expert group to elaborate upon the job requirements. The profile of this rating group, which reflects the makeup of each agency , was as follows:

	INCUMBENT RATING GROUP							
AGENCY	Male	Female	White	Black	Hisp.	Asian	Mean Age	Mean years Experience
Brigham City	20	2	21		1		36.6	10.3
Cedar City	22	1	22	1			34.6	7.6
Centerville	12		12				33.2	7.8
Escalanti	2		2				29.5	1.0
Kanab City	4		4				36.5	8.8
Layton City	36	3	36	1	1	1	34.0	6.8
Mapleton	no data provided							
Mount Pleasant	6		5		1		33.0	2.3
Ogden City	34	2	34		2		37.9	11.8
Orem	35	3	34		4		35.6	8.6
Plain City	5		5				33.8	6.0
Riverdale	9	2	11				35.2	8.0
Roy City	22	1	22	1			32.2	6.3
South Jordan	11		10	1			27.6	4.3
Springville	8		8				33.0	5.4
Spanish Fork	13		13				35.4	8.0
Uintah	no data provided							
West Jordan	14	1	15				33.7	5.1
West Valley	38	4	39		2	1	34.2	7.6

TOTAL	291 93.8%	19 6.2%	292 94.1%	4 1.3%	11 3.5%	3 1%	34.8	7.8

The sub-tasks were as follows:

2.1 **Definition of essential physical tasks.** Based upon the physical requirements of the job identified in Task 1 and upon past research on public safety physical tasks, a list of 46 essential physical tasks were identified and then submitted to a stratified random sample of incumbents for their assessments of those tasksô frequency and criticality, using five-point rating scales.

2.2 **Definition of the working conditions.** Based upon a list of 41 generic conditions (i.e., working outside, etc.) used in past projects, raters evaluated the extent that each condition affected the ability to perform the job. A scale of 0 to 3 was employed to measure a continuum of no effect to great effect.

2.3 **Definition of physical fitness abilities necessary to perform the essential tasks of the job**. An approach to classifying task performance is through the use of an identified domain of human abilities. Fleishman (1964) operationalized a system of physical performance abilities through factor analysis that provides a valid taxonomic system. His system has been modified into a Physical Ability Analysis Measurement Manual (PAAM) that has been successfully employed in several job analysis settings, including the law enforcement officer position of many federal, state, and municipal agencies (see Collingwood references 2-34), and related agencies such as San Bernadino city employees (Nyslander and Camean 1983), Philadelphia Police Department (Romashko, Hahn, and Brumback 1976) and Pacific Telephone and Telegraph positions (Zebeck 1975).

The underlying assumption of this approach is that basic to any task performance is a level of physical proficiency which is dependent upon underlying physical abilities and/or health status. Through extensive factor analysis, a domain of underlying abilities has been operationalized that can be rated and measured. A seven-point scaling technique has been designed. (High and low scale anchors for assessing amount of ability essential for a job). These scales have undergone evaluation and have been shown to demonstrate reliability among raters (r = 0.68-0.87, Zebeck 1975) and criterion related predictive validity (r = 0.64, Theologes and Fleishman 1973). In short, the use of a physical ability/health status rating system for assessing the dimensions' validity as essential factors for job performance has research support as a preferred methodology. In turn, research on using the rating process has demonstrated that using incumbent raters with the seven-point scales produced reliability coefficients between r = 0.87-0.98 and predictive validity coefficients between ability ratings and actual energy cost of performing job-tasks of between r = 0.72-0.81 (Hogan, Ogden, Gebhardt, and Fleishman 1980; Hogan

and Fleishman 1979). For this project, 15 ability items defined through previous research were utilized. Raters evaluated each fitness status area using a seven-point scale as to how essential that ability or status is to performing his/her job

2.4 **Physical demand analysis**. The raters were asked to define the physical demands of the job tasks in terms of duration, distance, weight, height etc. of the different physical tasks.

2.5 **Data analyses.** Statistical analyses were performed to provide means and standard deviations for all rated dimensions.

2.6 **Comparative analysis among agencies.** The job rating data from each agency were compared against the other agencies and the job ratings in total (from all agencies). The analysis concluded that there was enough commonality among the ratings between and among agencies that the separate agency job rating data could be grouped together to formulate the physical demands for all agencies.

2.7 **Job-task rating data were categorized.** Tasks were defined on a matrix of anatomical focus (upper body, lower body, total body) by generic physical activities (running, lifting, etc.).

TASK 3.0 JOB-TASK TEST DEFINITION

Fitness Intervention Technologies reviewed the JTA data to define "common" tasks rated by all agencies as either frequent or critical. Those tasks were, in turn arranged in realistic sequences into three job simulation scenarios. This study's data and conclusions from previous validations were factored into the judgement of how each scenario was defined. A discussion planning meeting was held in Salt Lake City April 6, 1999 to organize the validation testing process and gain a consensus on the job relatedness of the job task scenarios. Likewise, at the Fitness Coordinator training (April 1999), these scenarios were presented to the 21 officers representing 16 of the 19 agencies for their review and input on the realistic nature of the scenarios. There was general concurrence that the scenarios measure example tasks that officers have done or are expected to perform. Their input was factored into the final definition of the scenarios. There were four sub-tasks.

3.1 **Physical job-tasks were narrowed**. Tasks rated frequent and critical were narrowed to those most representative of the critical and frequent physical

demands of the job.

3.2 **Job-task scenario tests were defined**. The tasks were configured into representative task scenario tests for each of the previously defined job-tasks and the expected level of performance per task in terms of effort, duration, and/or outcome was defined. The tests defined were:

- Pursuit and subdue scenario
- Victim extraction
- Roadway clearance

3.3 **Thomas nad Means identified potential underlying physiological demands of selected job-task tests.** Those areas included the following:

- Aerobic power
- Anaerobic power
- Muscular endurance
- Strength
- Flexibility
- Agility
- Body composition

3.4 **Thomas and Means specified physical fitness tests.** Fitness tests representative of the physiological demands of the job-task tests were defined. They also had to be tests that did not require expensive apparatus and could be easily administered in the field. Those tests included the following:

- 1.5-mile run
- 300-meter run
- 1 minute sit-up test
- maximum push-up test
    - 1 RM bench press
- sit and reach test
    - vertical jump
    - Illinois agility run
    - skinfold caliper test

TASK 4.0 FITNESS COORDINATOR TRAINING

Thomas and Means provided a four day certification and training course on site at the Utah POST Academy in Salt Lake City April 12-15, 1999 to 21 officers from 16 agencies attended the training. The training was to prepare Fitness Coordinators to serve all 19 agencies by providing testing and programming instruction. All trainees successfully completed the training and certification.

TASK 5.0 EVALUATION TESTING

The purpose of this task was to collect the data necessary to validate the predictability of fitness for job performance. To conduct this phase of the project a sample of incumbent officers from all agencies were tested. Each agency's sample was stratified by age and gender and randomly selected (through the use of random numbers). Only those officers medically cleared within the agency participated. Fitness Intervention Technologies and the Fitness Coordinators conducted the basic evaluation testing of incumbent officers during the weeks of April 19-23 and 26-30 at three locations (Salt Lake City, Ogden City and Cedar City. In addition a make up testing session was conducted May 24, 25 in Salt Lake to test those officers who were rained out at previous testing. There were two major sub-tasks.

5.1 **Testing of participants**. Incumbents underwent the respective job-task test battery and fitness test battery as defined in Task 3. A total of 198 incumbents were tested.

5.2 **Trained Fitness Coordinators were briefed to conduct effectiveness ratings of subject's performance on the job task test scenarios.** Supervisors rated each subjectûs job task scenario performance.

TASK 6.0 DATA ANALYSIS

The purpose of this task was to provide the statistical analysis necessary to make the formal judgments about the job-relatedness of the physical fitness tests and standards. There were three (3) subtasks to this task.

6.1 **Performance profiles on all sample testing (i.e. job-task test data and physical fitness data) were calculated.** Profiles in terms of percentiles, means, and standard deviations on all job-task and fitness testing for the sample were calculated.

6.2 **Multivariate statistical analyses were performed.** Correlations and multiple regression analysis defined the underlying fitness factors and tests predictive of job-task test performance.

6.3 **Specificity and sensitivity analyses were performed.** These statistics were used to define the most accurate pass/fail cutoff points for the fitness tests. Potential raw scores were reviewed.

TASK 7.0 JUDGMENT PROCESS FOR FITNESS TESTS AND STANDARDS

The judgment process resulted in the identification of which fitness tests predicted effective performance and the levels of fitness (standards) required on each. The data from the review and job analysis provided the input to define the job for the judgment group. The testing data provided objective predictability trends. These data were critically considered in making the formal judgments. Besides the specific data from this project, longitudinal research and clinical experience were considered.

The judgment group consisted of a professional staff team including the following Fitness Intervention Technologies staff:

1) Two Exercise Physiologists
2) One Psychologist

There were three (3) sub-tasks to this task.

7.1 **Comparison of data.** This study's data were compared to data from other law enforcement agencies and to the Cooper Institute for Aerobics Research (CIAR) norms to ascertain commonalties and differences.

7.2 **Definition of the fitness test battery.** The fitness test battery was selected that most accurately measured, in an economical fashion, the capability to perform essential officer job-tasks.

7.3 **Definition of fitness standards.** Applicant selection and incumbent maintenance minimum standards were defined.

TASK 8.0 STANDARDS IMPLEMENTATION RECOMMENDATIONS

Recommendations were defined for applying the physical fitness standards process for the following eight (8) sub-tasks. Thomas and Means staff performed the following:

8.1 Reviewed and defined medical screening and safety guidelines for testing participation that meet the latest ADA requirements and ACSM/AHA guidelines.

8.2 Reviewed and defined an implementation sequence for testing and review.

8.3 Defined testing procedures for those tests (physical fitness and/or job-task tests)

requiring specifications.

8.4 Defined the recommended qualifications for the trained personnel involved in administering the testing sequence.

8.5 Made recommendations for ongoing data collection, analysis, and upgrades.

8.6 Defined an installation timeline for phasing in all elements of the testing and standards application program (applicants and incumbents).

8.7 Defined a recommended an incumbent fitness program.

8.8 Defined a recommended sequence for standards application and sanctions.

8.9 Defined personnel policy areas for each Department to address before implementing standards and program recommendations.

8.10 Made a formal presentation of the study results and to discuss implementation strategies on site.

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