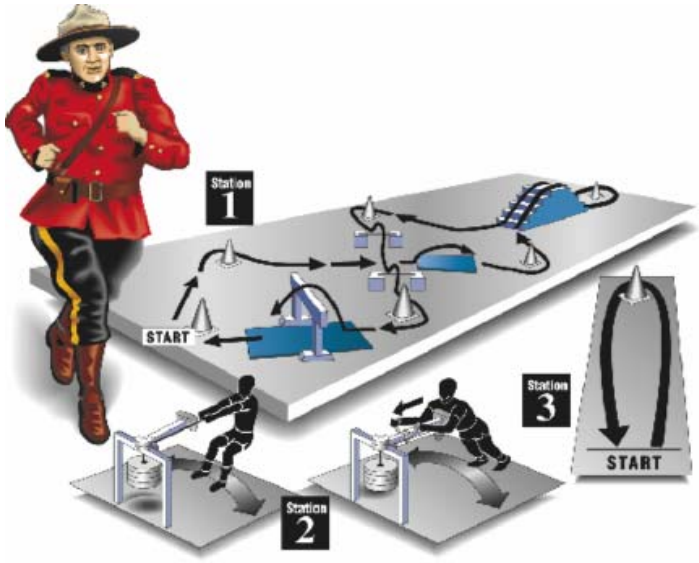
Physical Abilities Requirement Evaluation (PARE)

Phase 2
Discrete Item Analysis



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G.S. Anderson, Ph.D. and D.B. Plecas, Ed.D.

University of the Fraser Valley
33844 King Road, Abbotsford BC V2S 7M9

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UNIVERSITY COLLEGE of the FRASER VALLEY

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Physical Abilities Requirement Evaluation (PARE)
Phase 2: Discrete Item Analysis

G.S. Anderson and D.B. Plecas
University College of the Fraser Valley

Introduction

Bona fide occupational requirements can be defined as “a condition of employment that is imposed in the belief that it is necessary for the safe, efficient, and reliable performance of the job and which is objectively, reasonably necessary for such performance (Gledhill, Jamnik and Shaw, 2001: p 9).” Organisations who wish to impose a bona fide occupational requirement are required to identify the most demanding and most representative tasks performed in the occupation, and determine the physiological requirements that are required for the successful completion of these tasks. People seeking employment in, or those already employed in the profession, should then be expected to exhibit these characteristics as they are related to the person’s ability to successfully perform their expected job duties.

Human Rights legislation in most developed countries state that any selection criteria for employment must be directly related to job requirements, and be essential components critical to successful job performance (Farenholtz and Rhodes, 1990; Sothman et al., 2004). Each employer must be able to demonstrate that selection criteria are not discriminatory, demonstrate that each criterion is critical to job performance, and have clearly defined minimal acceptable levels for each of the selection criteria (Anderson et al., 2001; Rayson, Holliman and Belyavin, 2000). Each of the selection criteria must be a valid representation of the true job requirements, or a legal case can be successfully mounted against the employer (Eid, 2001).

The process for test validation was outlined in the recent submission by Anderson and Plecas (2007), entitled Physical Abilities Requirements Evaluation (PARE) Phase 1: Task Analysis (see figure 1). The first phase of bona fide occupational test development includes a comprehensive job review and task analysis, as described in that report. That report linked the discrete items in the present PARE to bona fide occupational requirements as determined through an evaluation of the physical requirements of members in controlling a physically demanding situation they had encountered within the past 12 months. That report and previous task analysis did support the PARE in its present format. In addition, the report offered and discussed considerations for further enhancement of PARE

based on the results of a comprehensive task analysis of general duty police work and critical incidents.

To fully appreciate the elements of the PARE that are most related to the role of police officers in the field, the present study surveyed a group of subject matter experts, and the incumbents concerning the present elements embedded within the PARE, and potential changes that could be made to improve the extent to which the PARE reflected the true physical requirements of police work. This process examined the discrete items presently in the PARE (see box 2 in figure 1), while examining the potential for additions, deletions and modifications.

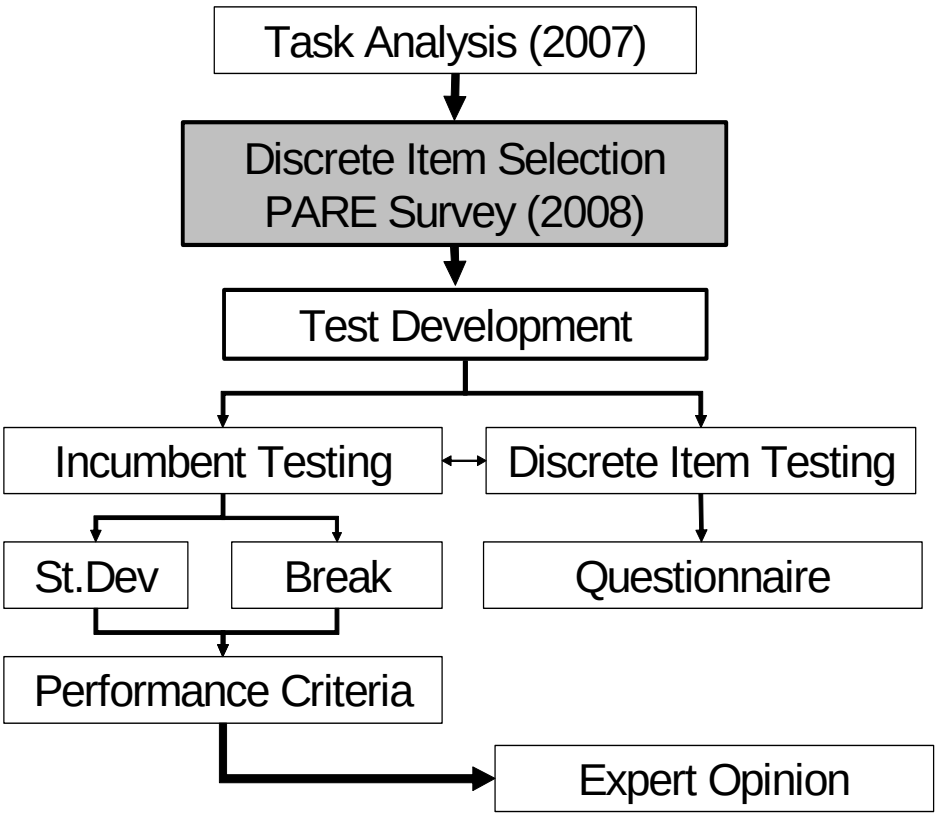

Figure 1: Bona fide occupational requirement test development overview.

Methods

This research project consisted of three distinct phases: 1. instrument development; 2. subject matter experts and instrument modification; and, 3. incumbent survey. Once the survey instrument was created, one researcher met with the subject matter experts (SMEs) at a national meeting in Regina, Saskatchewan. Each SME completed the survey, which was then used as a basis for discussion and revision of the instrument.

In total, 20 SMEs completed and returned the survey instrument. The SME group consisted of the Program Manager for the National PARE, Fitness & Lifestyle program, the 13 Division Fitness and Lifestyle Advisors (DFLAs), the Sergeant in charge of Depot Fitness & Lifestyle Unit and 5 fitness facilitators from that unit. The SMEs had, on average, administered 6100 PARE tests, with a median of 4500. Their experience as PARE administrators was on average 6.8 years, with a median of 9 years of testing experience, with one SME being part of the original PARE development project.

After completing the survey instrument, the SMEs were briefed on the project. From the SME group, the DFLAs were asked to disseminate the survey instrument to each member who completed the PARE between December 1st 2007 and June 15th 2008. In total, 1140 surveys were printed, with a goal of collecting 900 survey instruments. The DFLAs administered the questionnaire, collecting informed consent from officers immediately after they completed the PARE, following which officers were provided the questionnaire itself that they completed in person. Completed forms were placed in an addressed envelope provided, sealed, signed and returned to the DFLA upon their final screening following their PARE test. Periodically, completed questionnaires were forwarded to the researchers to enable timely data entry.

Targets for the number of questionnaires distributed were set for each region of Canada based on the number of members serving in the region. Overall, the regular members surveyed are considered a good cross-section of RCMP members across the country (see Table 1), with 844 surveys returned.

Returned surveys were coded and entered on to an SPSS (version 12) database for analysis. Questionnaires from DFLAs were analysed separately.

Table 1: Regular members' characteristics

Work location

Atlantic Region	11.2%
B Division - Newfoundland	3.8%
H Division – Nova Scotia	.8%
L Division – P.E.I.	.0%
J Division - N.B.	6.6%
Central Region	28.3%
C Division – Quebec	12.2%
A Division – Ottawa region	.8%
NHQ – Ottawa HQ	8.1%
O Division - Ontario	7.2%
North West Region	27.3%
D Division - Manitoba	9.7%
F Division – Sask.	5.3%
T Division – Depot/Regina	2.1%
K Division - Alberta	8.8%
V & G Division - NWT	1.4%
Pacific Region	32.1%
E Division - B.C.	32.1%
M Division - Yukon	.0
Others	.9%

Gender

% female	15.1%
% male	84.9%

Age

20-29	18.6%
30-39	39.6%
40-49	33.7%
Over 50	8.7%

Years of service

0-4	25.2%
5-9	23.5%
10-14	12.5%
15-19	13.0%
20-24	13.1%
25 plus	12.5%

Present duties

General duty	46.9%
Administration	14.2%
Other	38.8%

Primary work location

Isolated	4.6%
Rural	29.4%
Urban	66.0%

Present PARE time (by gender): Difference statistically significant at <.001.

Female members	4:19
Male members	3:43

Present PARE time (by age): Differences statistically significant at <.001.

20-24	3:33
25-29	3:31
30-34	3:39
35-39	3:41
40-44	3:51
45-49	4:02
50-54	4:15
55-59	5:25
60 plus	4:09

Results

The target for data collection in the present study was 20 Subject Matter Experts (SMEs), and 900 regular member surveys, providing a representative sample across Canada. Surveys were completed by SMEs at a meeting in Regina, while surveys were handed out to members immediately after they completed their PARE. It is estimated that there was a greater than 95% response rate (ie. 96.3%), with 844 completed surveys being returned.

The results are presented for the members who completed the PARE, and for the SMEs below. Results are presented in sections corresponding to the obstacle course, the push/pull, and the weight carry sections of the PARE.

The Obstacle Course

Regular Member Survey: In terms of detailed assessments of the PARE, members were first asked to consider the relevance of the obstacle course. Specifically they were asked to rate the relevance of significant components of the obstacle course including the mat jumps, the stairs, the low hurdles, the vault, controlled falls, and the run length. And as it turns out, as Table 2 shows, the vast majority of members see each component as relevant. At the same time, it is noteworthy that only a very small percentage of officers described any single component as “irrelevant” or “or very irrelevant” (again see Table 2).

Table 2: Regular members’ ratings of the ability of the obstacle portion of the PARE to realistically represent the tasks required of police officers in the field.

	Percentage of responses				
	VR	R	PR/I	I	VI
The matt jumps	27.0	**53.3**	15.4	3.7	0.6
The stairs	**47.4**	46.5	5.5	0.4	0.2
The low hurdles	27.3	**50.8**	17.9	3.2	0.8
The vault	33.0	**48.3**	15.6	3.0	0.1
The controlled falls	26.0	**44.7**	21.0	6.9	1.4
The run length	35.3	**51.7**	9.8	2.3	1.0

Very Relevant (VR), Relevant (R), Partially Relevant / Irrelevant (PR/I), Irrelevant (I), Very Irrelevant (VI)

Over all, when asked “In your opinion, the obstacle course segment of PARE is,” 85.9% of the officers responded with very relevant (30.4%) or relevant (55.7%). Only 1.7% responded as very irrelevant.

Not only did respondents see the obstacle course as relevant, they rated each component as being just about right in terms of its specific demands. For example, when asked to rate whether or not the low hurdles were too low or too high, 76.1% of members in effect rated it as neither (see Table 3). As Table 3 shows, this same pattern of response was apparent with respect to each feature considered.

When looking at the distribution on each side of the mid-way mark a reasonable percentage (in decreasing order) of regular members rate the vault as too low (20.6%); the stairs as too few (20.5%); the controlled falls as too many (18%); the run length as too short (17.8); matt jump as too short (15.5%); and the low hurdles as too low (17.6%). For five of the six elements, an important proportion of regular members (17.6-20.6%) rate them as being too low, too few or too short. The only exception is with the controlled falls were 18% rating them as too many.

The trend for the marginal responses (on each side of the mid-way) seem to be in favour of a more demanding obstacle course – longer matt, more stairs, higher hurdles, higher vault and longer run length – the only exception being fewer controlled falls

Table 3: Regular members’ ratings of the ability of *individual elements* of the obstacle portion of the PARE to realistically represent the tasks required of police officers in the field.

	Too…	Percentage of responses					Too…
The matt jumps	Short	2.2	13.3	**73.9**	7.9	2.8	Long
The stairs	Few	3.4	17.1	**71.2**	6.6	1.7	Many
The low hurdles	Low	2.7	14.9	**76.8**	4.5	1.1	High
The vault	Low	4.5	16.1	**74.8**	3.6	1.1	High
The controlled falls	Few	0.8	10.5	**70.7**	11.5	6.5	Many
The run length	Short	3.9	13.9	**74.2**	6.2	1.8	Long

Further on the matter of the obstacle course, and consistent with the findings provided by Tables 2 and 3, the vast majority of members do not recommend any changes to any single feature of the PARE. Indeed, as Table 4 shows, over 90% of members recommend retaining the obstacle course “as is” avoiding the two extremes in the scale (ie. too short or too long). No more than 2% of the 844 members completing the questionnaire commented that any single component of the obstacle course should be deleted.

Among those members who suggested that the obstacle course should be modified, the majority offered comments simply reiterating their ratings respecting the demands of the course. For example, among members who provided comments (See Appendix B) together with their recommendation, suggestions were made for:

More demanding items:

- 73% suggested that the vault be higher
- 60% suggested that their should be more stairs
- 51% suggested that the run length be longer
- 52% suggested more (14%) and higher (38%) hurdles.
    - Only 35% suggested fewer (29%) or lower (5%) hurdles

Less demanding items

- 76% suggested fewer or no controlled falls and;
- 57% suggested a shorter (35%), fewer or no matt jumps (22%).
    - Only 37% suggested longer or more matt jumps.

With the exception to the matt jump, these recommendations show some similarities with the trends of the marginal responses from Table 3.

Table 4: Regular members' opinion as to whether elements of the obstacle portion of the PARE should be retained 'as is' or modified.

	Retain 'as is' (%)	Modify (%)
The matt jumps	**85.1**	14.9
The stairs	**86.8**	13.2
The low hurdles	**85.4**	14.6
The vault	**84.9**	15.1
The controlled falls	**82.2**	17.8
The run length	**88.7**	11.3

Finally respecting the obstacle course within the PARE, it was interesting to find that members' backgrounds did not appear to influence their ratings of any single component of the course. That is, members' current work Division, primary work location, duties, years of service, and age were not associated in any way to the ratings they assigned. Likewise the ratings members assigned were not associated to how long it took them to run the PARE or how many times they had run it. In fact the only single notable difference in responds was with respect to those who recommended modifications to the mat jumps. Specifically, whereas 23.9% of female members recommended modifications, only 13.6% of male members did so.

Subject Matter Experts: As with regular members surveyed, the vast majority of subject matter experts see each component of the obstacle portion of the PARE as relevant (see Table 5). In fact the only aspect of this component of the PARE about which there was some noticeable concern about relevance was with respect to the controlled falls. Specifically, as Table 5 shows, 26.4% of subject matter experts saw this aspect of the obstacle portion irrelevant. This aspect is also the one that received the highest percentage for irrelevant and very irrelevant from the regular members (8.3%).

Table 5: Subject Matter Experts' ratings of the ability of the obstacle portion of the PARE to realistically represent the tasks required of police officers in the field.

	Percentage of responses				
	VR	R	PR/I	I	VI
The matt jumps	21.1	**73.7**	-	5.3	-
The stairs	47.4	**52.6**	-	-	-
The low hurdles	11.1	**72.1**	11.5	5.6	-
The vault	26.3	**47.4**	15.8	10.5	-
The controlled falls	10.5	**47.4**	15.8	21.1	5.3
The run length	26.3	**68.4**	5.3	-	-

Very Relevant (VR), Relevant (R), Partially Relevant / Irrelevant (PR/I), Irrelevant (I), Very Irrelevant (VI)

Table 6 shows, that SMEs rated four components as being representative of the tasks required as police officers, including the matt jump, the stairs, the low hurdles and the run length. The support for these four items were higher for the SMEs, ranging from 78.9% to 84.2%, compared to 71.2% to 76.8% support from regular members for the same four items. The SMEs were less favourable concerning the appropriateness of the vault (with 47.5% being in agreement with it in its present form) and the controlled falls (with 50.0% being in agreement with it in its present form), compared to 74.5% and 70.7% respectively from regular members.

When looking at the distribution on each side of the mid-may mark a reasonable percent (in decreasing order) of SMEs rate the vault as too low (52.6%), the controlled falls as too many (38.9%), the stairs as too few (16.7%), the low hurdles as too low (16.7%), the run length as too short (15.8) and the matt

jump as too short (15.8%). For five of the six elements a proportion of the SMEs (15.8-62.6%) rate them as being too low, too few or too short. The only exception is with the controlled falls with 38.9% rating them as too many.

The trend for the marginal responses (on each side of the mid-way) seem to be in favour of a more demanding obstacle course – longer matt, more stairs, higher hurdles, higher vault and longer run length – the only exception being fewer controlled falls. This is consistent with the trend observed with regular members.

Table 6: Subject Matter Experts' Ratings of the ability of *individual elements* of the obstacle portion of the PARE to realistically represent the tasks required of police officers in the field.

	Too…	Percentage of responses					Too…
The matt jumps	Short	5.3	10.5	**84.2**	-	-	Long
The stairs	Few	-	16.7	**83.3**	-	-	Many
The low hurdles	Low	-	16.7	**83.3**	-	-	High
The vault	Low	10.5	42.1	**47.4**	-	-	High
The controlled falls	Few	5.6	5.6	**50.0**	22.2	16.7	Many
The run length	Short	-	15.8	**78.9**	5.3	-	Long

The Push / Pull

Regular Member Survey:

Another aspect of the PARE that members were asked to assess through the questionnaire is the push/pull segment. As with the obstacle segment they were asked to rate the relevance of significant components of the push/pull segment including the push component, the pull component, controlled falls, and the overall duration. Once again, as with the obstacle course, the vast majority of members see each component as relevant (see Table 7). In fact, with the exception of the controlled falls component, less than 4% of members described any component as either “irrelevant” or “very irrelevant”. In the case of controlled falls, 11.1% of members described that component as either “irrelevant” or “very irrelevant” (again see Table 7).

Table 7: Regular members’ ratings of the ability of the push/pull portion of the PARE to realistically represent the tasks required of police officers in the field.

	Percentage of responses				
	VR	R	PR/I	I	VI
The push segment	32.3	**52.5**	12.5	1.9	0.8
The pull segment	30.3	**52.7**	14.0	2.2	0.8
The controlled falls	21.9	23.4	**23.5**	8.9	2.4
Duration	26.5	**54.1**	15.7	3.0	0.7

Very Relevant (VR), Relevant (R), Partially Relevant / Irrelevant (PR/I), Irrelevant (I), Very Irrelevant (VI)

As well as seeing the push/pull segment as relevant (with the exception of controlled falls), the majority of members rated each component (push, pull, falls, duration) as being about right in terms of its specific demands (see Table 8). The support from the regular members for the four items of this section ranged from 69.4% to 79.1%.

Very few members rated either the push or pull components as too heavy. In fact, 22% considered the push segment and 25.1% the pull segment as too light. (See table 8). The trend for the marginal responses (on each side of the mid-way) seems to be in favour of a heavier weight for both the push and pull components, while being evenly distributed for the four controlled falls. As for duration, 15.7% of regular members find it to be too long.

Table 8: Regular members' ratings of the ability of *individual elements* of the push/pull portion of the PARE to realistically represent the tasks required of police officers in the field.

	Too…	Percentage of responses					Too…
The push segment	Light	2.3	19.7	**70.6**	5.6	1.8	Heavy
The pull segment	Light	3.3	21.8	**69.9**	5.3	0.8	Heavy
The controlled falls	Few	1.2	13.4	**69.4**	11.1	4.8	Many
Duration	Long	1.6	14.1	**79.1**	4.4	0.8	Short

Further with respect to the push/pull segment of the PARE, the vast majority of members when asked did not recommend any changes to either the push or pull components of this section of the test. Specifically, 86.9% of members recommend retaining the push component "as is" and a near equal percentage of members (i.e. 87.5%) recommend retaining the pull component "as is" (see Table 9). Among those members who suggested that either the push or pull components be modified (see appendix B) nearly half recommended more weight for the push (42%) and the pull (57%) components while only 20% and 11% of the members recommended less weight for the push and the pull components, respectively. Hardly any members recommended doing away with either the push or pull components. Specifically, only 3 of the 884 members completing the questionnaire suggested deleting the push component and only 3 suggested deleting the pull component.

Table 9: Regular members' opinion as to whether elements of the push/pull portion of the PARE should be retained 'as is' or modified.

	Retain 'as is' (%)	Modify (%)
The push segment	**87.0**	13.0
The pull segment	**87.5**	12.5
The controlled falls	**82.7**	17.3

Finally concerning the push/pull segment of the PARE, an analysis of members' backgrounds relative to the ratings on any single component did not show background characteristics to be influencing members' ratings. That is, member's

current work division, primary work location, duties, years of service, and age were not associated to the ratings they assigned in completing the questionnaire. Similarly, the ratings members assigned to how long it took them to run the PARE or the matter of how many times they had run it was not affected by their background characteristics. As with the finding respecting the obstacle course, the only single notable difference in responses was with regard to those who recommended modifications to the push component and that was on the issue of gender. Specifically, whereas 26.6% of female members recommended modifications, only 10.5% of male members recommended modifications. Among females members who offered comments on modifications to the push component, virtually half felt that there should be less weight involved.

Subject Matter Experts:

Clearly, as Table 10 shows, subject matter experts are overwhelmingly in agreement that the push/pull aspect of the PARE is relevant, with none of them describing it as irrelevant. As Table 11 indicates though, a significant percentage of them considered the push segment (22.2%) and the pull segment (27.8%) as too light. This is consistent with the value reported by regular members (22% and 25.1%).

As for the controlled falls, 29.4% of SMEs felt that there are too many controlled falls required. This is nearly double the reported data from regular members (15.9%). In addition, only 5.9% of SMEs considered that there were too few controlled falls compared to 14.6% for regular members (see table 8). This seems to be the most significant difference between SMEs and regular members' percentage of responses for the push/pull section of PARE.

Table 10: Subject Matter Experts' ratings of the ability of the push/pull portion of the PARE to realistically represent the tasks required of police officers in the field.

	Percentage of responses				
	VR	R	PR/I	I	VI
The push segment	**50.0**	38.9	11.1	-	-
The pull segment	**50.0**	44.4	5.6	-	-
The controlled falls	11.1	**72.2**	16.7	-	-

Very Relevant (VR), Relevant (R), Partially Relevant / Irrelevant (PR/I), Irrelevant (I), Very Irrelevant (VI)

Table 11: Subject Matter Experts' ratings of the ability of *individual elements* of the push/pull portion of the PARE to realistically represent the tasks required of police officers in the field.

	Too…	Percentage of responses					Too…
The push segment	Light	-	22.2	**77.8**	-	-	Heavy
The pull segment	Light	-	27.8	**72.2**	-	-	Heavy
The controlled falls	Few	-	5.9	**64.7**	23.5	5.9	Many

The Weight Lift and Carry

Regular Member Survey:

As with the other aspects of the PARE the vast majority of regular members (i.e. 64.8% to 72.3%) saw the weight lift and carry aspect as relevant or very relevant (see Table 12). Indeed, fewer then 11% of them described the length, the weight of the carry and the rest time provided as irrelevant. The aspect receiving the highest percentage of irrelevant or very irrelevant was the technique of the carry at 14%.

Table 12: Ratings of the ability of the lift and carry portion of the PARE to realistically represent the tasks required of police officers in the field.

	Percentage of responses				
	VR	R	PR/I	I	VI
Length of carry	20.6	**50.9**	19.5	7.7	1.3
Weight of carry	21.0	**51.3**	17.7	8.4	1.6
Rest time provided	20.1	**50.1**	19.5	8.1	2.3
Technique of carry	18.8	**46.0**	21.1	11.1	2.9

Very Relevant (VR), Relevant (R), Partially Relevant / Irrelevant (PR/I), Irrelevant (I), Very Irrelevant (VI)

Further, as Table 13 shows the clear majority of regular members saw the length and weight of the carry as consistent with job duties, with 63.4% and 67.2% find the length and weight appropriate. The trend for the marginal responses (on each side of the mid-way) seem to indicate that members perceive the weight of the carry as too light (28.4%), and the length of the carry (23.9%) and rest time provided (21%) as too long.

Table 13: Ratings of the ability of *individual elements* of the lift and carry portion of the PARE to realistically represent the tasks required of police officers in the field.

	Too…	Percentage of responses					Too…
Length of carry	Short	1.1	11.5	**63.4**	14.3	9.6	Long
Weight of carry	Light	6.2	21.5	**67.2**	4.2	0.9	Heavy
Rest time provided	Long	5.1	14.9	**73.3**	5.0	0.9	Short

Table 14 shows the highest percentage of regular members (29.5%) recommending to modify a specific element of PARE, namely the weight lift and carry section. In comparison the two other highest components to be modified were the controlled falls within the obstacle run section (17.8%) and within the push/pull section (17.3%).

Among those members who provided comments with regard to the weight carry be modified (see appendix B), 69% recommended to increase the weight or effort (longer distance and/or heavier weight), while only 13% recommended less weight, no weight (delete) or shorter distance.

Table 14: Member opinion as to whether elements of the lift and carry portion of that should be retained ‘as is’ or modified.

	Retain ‘as is’ (%)	Modify (%)
Weight of carry	70.5	29.5

Subject Matter Experts:

It is on the matter of the weight lift and carry section of the PARE that there appears to be a lack of consensus among subject matter experts. First, as Table 15 shows, a significant percentage of subject matter experts see various elements of this section irrelevant. Specifically, 47.1% see the weight element as irrelevant, 40.0% see the rest time provided as irrelevant and 17.6% see the length of carry as irrelevant.

Table 15: Ratings of the ability of the lift and carry portion of the PARE to realistically represent the tasks required of police officers in the field.

	Percentage of responses				
	VR	R	PR/I	I	VI
Length of carry	17.6	**35.3**	29.4	17.6	-
Weight of carry	-	**35.3**	17.6	35.3	11.8
Time provided	6.7	**33.3**	20.0	40.0	-

Very Relevant (VR), Relevant (R), Partially Relevant / Irrelevant (PR/I), Irrelevant (I), Very Irrelevant (VI)

At the same time, Table 16 indicates SMEs see the time provided as being too long (58.8%), the weight involved as being too light (35.3%) and the length of carry as being too long (23.5%). While the percentage varies, the trend is consistent with the concerns expressed by regular members (see table 13).

Table 16: Ratings of the ability of *individual elements* of the lift and carry portion of the PARE to realistically represent the tasks required of police officers in the field.

	Too…	Percentage of responses					Too…
Length of carry	Short	-	5.9	**70.6**	23.5	-	Long
Weight of carry	Light	-	35.3	**52.9**	11.8	-	Heavy
Time provided	Long	29.4	29.4	**41.2**	-	-	Short

Discussion

For the purpose of discussion, this section will be divided into the three components of the PARE that were examined in the survey used – obstacle courses, push/pull, and weight lift and carry. This will be followed by the recommended changes proposed by the members, the SMEs and the recommendations made in Phase 1 - PARE Task Analysis 2007 (Anderson and Plecas, 2007).

Before we begin the discussion, it must be stated that both the results of Phase 1 of this study – the PARE Task Analysis 2007 (Anderson and Plecas, 2007) and the present results from Phase 2 – Discrete Item Analysis (PARE Survey) 2008 both provide strong support for the PARE in its present form.

Obstacle Course Section:

Anderson and Plecas (2007) found 44% of the officer ran during a critical incident, for an average of 195 meters (range of 2 – 2000 meters; median = 50m) with runs lasting between 20 seconds to 4 minutes. Runs often included sharp turns (61%), climbing or vaulting (18%), climbing over objects (16%), up stairs (16%) and vaulting (7%).

During a regular shift, 56% of the officers report running often. It is not surprising then, that 86.1 % of the officers reported the obstacle course to be relevant or very relevant to their job duties. The vast majority of members identified each element embedded within the obstacle course as relevant of very relevant. Only a very small percentage of officers described any single component as “irrelevant” or “or very irrelevant”.

The length of the course: The PARE test provides for changes of direction and jumps during 6 laps of a figure eight obstacle course covering a distance of 340m. Embedded within the run are seven obstacles (mat, stairs (twice), 2 low obstacles, 1 barrier and one fall). The obstacle portion of the PARE takes approximately 25 seconds per lap for a total of 2 minutes and 30 seconds which is supported by previous data (Anderson and Plecas, 1999, 2007). Recommendation to the RCMP in 2007 suggested maintaining the total distance at or near 340m and a completion time for the obstacle course at or near 2 minutes and 30 seconds. Member responses from the present survey support this notion with 88.7% of the members suggesting to retain the run length of those responding, 87.2% found the run length to be relevant or very relevant, and only 3.3% found it to be irrelevant or very irrelevant; 94.3 found the length to be neither too long or too short, while 3.8% reported it to be too short, and 1.9% reported it to be too long.

Subject matter experts also found the run length to be appropriate, with 94.7% of the SMEs rating the length as very relevant or relevant.

The controlled falls (following the vaults): No incidence of falling while climbing or vaulting objects were recorded in direct observation of officers (Anderson and Plecas, 1999). For this reason, Anderson and Plecas (2007) recommended removing the six controlled falls (or decreasing their numbers) from the obstacle course section. In the present study 80.0% of respondents reported the controlled falls to be relevant or very relevant, while 8.0% reported them to be irrelevant or very irrelevant. When responding to the retention of this element, 17.3% of respondents suggested modifying this element (second only to the lift and carry), with 4% of the population suggesting fewer controlled falls, and 3% suggesting deleting the controlled falls all together. In the open comments, 30.1% of all those responding (n=156) suggested deleting the controlled falls, while of those who suggested revision to this element, 74.7% suggested eliminating the controlled falls, or reducing their number (see Appendix C). SMEs also found this element to be one of the most problematic portions of the PARE with 42.2% of the SMEs reporting the controlled falls to be irrelevant or very irrelevant.

The height of the barrier: In the PARE, the height of the barrier is set at 0.9 m (3 feet). When considering the previous Canadian findings with respect to “getting to the problem” the three studies which document the height of the vault refer to a height of (or near) 1.5 m (5 ft.) (Anderson and Plecas, 2007). The Test d’Aptitudes Physiques – École Nationale de Police du Québec (TAP-ENPQ) includes two fences 183cm in height (6 feet) – one flat fence with no texture on the fence surface and one chain link fence with the ability to place toes into the fence material to aid in the scaling of the obstacle (Leger, 2004). The California Highway Patrol also uses a 183 cm (6 feet) chain link fence.

Anderson and Plecas (2007) found 12.1% of the RCMP members responding to the questionnaire to climb over an object with an average height of 1.6 meters (5 feet 4 inches), and median height of 1.5 meters (5 feet). These authors recommended replacing the 0.9 m (3 feet) barrier with a 1.5 – 1.8m (5 - 6 feet) barrier/wall, which would be better aligned with the reported data. Further, with an increased height, it was recommended that the barrier have a textured surface with a wire grid or ridge on the obstacle.

Officers who participated in the present study generally (82.0%) found the vault to be relevant or very relevant; However, 21.3% of the respondents suggested the vault was lower than it should be. In their professional opinion 15.3% suggested this item be modified, with 9% suggesting it should be higher. When asked if the item should be retained as is, 96 suggested modifications, with 46.9% of these

suggesting it should be higher. Only 10.5% of the SMEs suggested the vaults were irrelevant, and comments suggested raising the height, and potentially making it a chain link fence.

Manipulating an object: Anderson and Plecas (1999, 2007) found that officers regularly manipulated objects (such as a radio or flashlight) in the course of their duties. These tasks require complex motor control in both rested and fatigued states. Anderson and Plecas (2007) suggested that the RCMP investigate the use of a flashlight to trigger a photo-cell that initiates and concludes the timing of the obstacle run to demonstrate fine motor control in both the rested and fatigued states, similar to the Test d'Aptitudes Physiques – École Nationale de Police du Québec (TAP-ENPQ) (Leger, 2004).

In the present study, officers were asked about potential additions to the PARE (See Survey in Appendix A and responses in Appendix C). Respondents suggested talking and decision making, or responding to a radio message, while others responded with suggestions about firearms and use. No respondent or SME suggested such a novel task, although the addition of such a task would address a portion of the comments made about fine motor skills while tired, shooting accuracy and manipulative skills.

Push/Pull Section

Anderson and Plecas (2007) found 61% of the suspects to offer physical resistance pushing and/or pulling on the officer during a critical incident. In response, the officers reported pushing and pulling a suspect 76% of the time, resulting in handcuffing 72% of the time. Using data from direct observation Anderson and Plecas (1999) predicted that an officer can expect to engage in tussling 14 times per year, and wrestling 7 times, while only twice per year (on average) were they likely to engage in a full-scale fight.

The 'fight segment' of the PARE lasts approximately 70 seconds (25 seconds for each of the push and pull, and 20 seconds for the controlled falls), and while longer than the average encounter, is well within the realm of possibility. For this reason, Anderson and Plecas (2007) supported the inclusion of the push/pull in the PARE. The present results support this notion, with 84.5% reporting this item to be relevant of very relevant. The push and pull were well supported, while 80.3% suggested the duration of the segment was relevant or very relevant.

The controlled falls (between the push and pull activities): The controlled falls between the push and pull activities offer some face validity as a police officer could very well fall during the apprehension of a suspect, as part of tussle, or in gaining control or fighting with a suspect.. However, this has not been reported or observed in previous data. In the present study the controlled falls were not as well supported as the push and pull segment in general with 10.1% suggesting they were irrelevant or very irrelevant., and 15.5% suggesting there were too many controlled falls during this segment. SMEs were also critical of the controlled falls and reductions may be warranted.

Anderson and Plecas (2007) recommended the inclusion of two controlled falls (instead of four) between the push and pull activities to bring the total push and pull segment time to approximately 60 seconds, which would be well aligned with the reported data, and would offer greater face validity. This was also suggested in written comments by those offering modification to the push/pull apparatus.

The resistance for the push/pull section: Data from Anderson and Plecas (2007) could not provide data concerning the resistance encountered; however, after reviewing the literature, these authors recommended maintaining the 36 kg (80 lbs) resistance for the push and pull activities. Present data also supports the weight of the push and pull segments. Within the present data 2.3% reported the push segment to be too light, while 2.0% reported it to be too heavy and 95.7% were in reasonable agreement with the weight. The pull results were similar, with 3.3% suggesting it was too light, and 0.9% reporting it to be too heavy, and 95.8% in reasonable agreement.

Comments pertaining to the retention ‘as is’ or modification of the push and pull found 86.9% and 87.5% of respondents favouring retention ‘as is’. With the push, of the 72 who commented for change, 41.7% of the members suggested more weight, while 13.9% suggested having the height modifiable. With the pull, of the 72 members who suggested modification, 55.6% suggested more weight. The SMEs were over whelming in support of retaining the push and pull, with no single entry suggesting the elements were irrelevant or very irrelevant.

Arm Restraint Simulation: In real life, 76% of encounters at critical incidents require a confrontational suspect being place in handcuffs (Anderson and Plecas, 2007). While the art of handcuffing requires a certain set of skills which are taught at the training academy, handcuffing requires a certain degree of physical abilities (independent of skills) in order to be able to perform the task. These physical abilities are not explicitly included in PARE, although have been included in other physical abilities tests used in the police world such as the Ontario Physical

Readiness Evaluation for Police (PREP) test (Ontario Ministry of Public Safety and Security, 2002).

The PREP utilizes an Arm Restraint Simulator where the person has to "depress the handles on the grips of both arms of the simulator. It takes 14.5 kg (32 lb) of force to depress each grip. With the grip constantly depressed, the arms of the equipment are forced together and then returned to their starting position. It takes 16 kg (35 lb) of force to retract each arm." Anderson and Plecas (2007) recognized the value of such an addition to the PARE, and suggested that any changes to the PARE examine placing a handcuffing component immediately after the push/pull and be within the timed portion of the final PARE time.

Interestingly, in the present study there was an open ended question concerning what one would add to the PARE to make it more relevant to the job of an RCMP member. Responses to the open ended question about additions to the PARE had very few suggestions related to handcuffing, and dealing with suspects after the fight segment, however, this was expected as this type of activity presently lies outside of the present PARE activity and most comments were directed at elements that existed.

Weight Carry Section

The most frequently lifted and carried object is a male suspect (Anderson and Plecas, 1999, 2007; Anderson, Plecas and Segger 2000; Farenholtz and Rhodes, 1990). In 2007 Anderson and Plecas recommended changing the present Weight Carry section with a Mannequin Drag using a value comparable to the average weight of male suspects. Data from the present study suggest that the lift and carry portion of the PARE is the least supported element by members and generated the most comments. While one could argue from the results that there is relevance to job performance in the lift and carry (77.3% indicated it was relevant or very relevant), 24.4% suggested it was too short, and 28.4% suggested it was too light. Further, 29.6% of the respondents suggested modifying this element (the single most of any element), with 10.1% suggesting deleting this element, and 44.7% suggesting more weight with a Mannequin Drag component rather than lift and carry. Further, SMEs also found this element to be less realistic, and suggested modifying this element to include a Mannequin Drag of a weight representing the average male suspect. This was also specifically mentioned by 25.0% of the officers commenting on change to this element (see Appendix B).

The lift and carry portion of the PARE can be easily modified as is not included in the timed portion of the test, and is only a pass or fail element.

Conclusions

The RCMP has made several gains over the past 12 years with regards to the acceptance of the actual PARE, but they are still facing some challenges in fully incorporating PARE as part of the police culture across all divisions. While many organizations use PARE as part of their recruiting process (with applicants) or their training curriculum (with cadets), very few police organizations ask their police officers to complete PARE and/or meet the 4:00 minute criterion time. The RCMP is a leader in this aspect as it requires their police officers to perform PARE every three years as part of their police training week. Although members do not need to meet the 4:00 minute PARE standard, with the exception of certain specialized units, 75% of RCMP police officers participating in PARE already complete the test within the 4:00 objective.

The whole question of PARE requirement for police officers could become an issue as the Canadian Human Rights Commission indicates that you cannot ask of an applicants or a trainee something that you would ask of an incumbent. Asking a PARE standard for applicants and Cadets for employment, but not asking all incumbents to perform the same test could be perceived as a double standard. While the RCMP is not fully meeting this aspect it can be considered as progressing toward having all their members perform PARE on a regular basis and strive to meet the 4:00 objective. This leadership from the RCMP could serve as a model for other police organization in promoting fitness for duty and meeting the spirit of the Canadian Human Right Commission. The main challenge remains the need to significantly increase PARE compliance in all regions of Canada.

Where to From Here?

The first phase of bona fide occupational test development (or re-validation process) includes a comprehensive job review and task analysis, as described in Phase 1 (Anderson and Plecas, 2007). The current Phase examined the discrete items embedded within the PARE using responses from a pool of subject matter experts, and police officers.

Present data provides strong support for the present configuration in the PARE. While consideration should be given to the enhancement of the PARE, the current and previous task analysis do support the test in its actual format and representative or very representative of police work in the 21st century. This is supported by the results of the POPAT re-validation data (Anderson and Plecas, 1999), and by previous work within the RCMP (Girard, 2003). From 1998 to 2002, a total of 8,320 RCMP police officers participated in PARE after which 30.1% were provided a survey to complete asking about the job-relatedness of the PARE. Combined with the data from Anderson and Plecas (2007) in Phase 1 of this study,

there is good support for the present PARE configuration; However, when examining each section of the test individually, conclusions were that there is room for improvement.

The RCMP should consider updating the PARE and conducting further research to examine the recommended enhancements and their implementation. Should the RCMP choose to modify the PARE based on the previous recommendations and the findings of the present study, this phase would involve testing the new additions to the PARE which, after expert review, may include: new obstacle course section (with a higher barrier and no controlled falls); revised push/pull section (with only two controlled falls between the push and the pull); new arm restraint section (the same as the one used in PREP); new Mannequin Drag section replacing the weight carry section; and, the potential use of a light-sensors for a timing switch (triggered by pointing a flashlight at it). Once the revised test was be developed and found to be representative, a criterion score would need to be developed to reflect the minimal occupational requirement – a score that below which performance is unsatisfactory as the satisfactory performance of job tasks is unlikely (see Sothman et al., 2004). This criterion could then be used to examine adverse impact.

Considerations and recommendations…

With respect to the PARE, the RCMP has in essence four options: keeping the PARE protocol “as is”; keeping the protocol “as is” and redefining the criteria measure; to embark on a full redevelopment of PARE; or, to focus on small additions or improvements that would further enhance PARE without jeopardizing the 4:00 standard. The RCMP will have to decide if they want to keep PARE as is (since it already receives sufficient support from Task Analysis 2007 and PARE Survey 2008) or if they want to embark on the process of developing and validating an upgraded version of PARE. The later option could be time consuming and require considerable financial and human resources when considering all the changes this could involve, namely:

- Developing, forwarding and receiving funding for a research project
- Getting the buy-in from RCMP police officers and partners
- Developing an enhanced version of PARE
- Determining and validating a time standard for the new protocol
- Training of PARE Administrators with new protocol requirements/application
- Communicating the changes to RCMP police officers and partners (recruiting sections and other police organizations already using PARE)

- Developing/updating of all PARE documents (Administrator Manual, Protocol, Website Info, Training Programs, etc.)
- Developing/updating procedures, forms, and quality control measures
- Implementing the new test
- Modifying the data entry module in the RCMP Human Resources Management Information system (HRMIS).

In the end, there would be no guarantee that the new protocol acceptance would exceed the support demonstrated for the PARE in its present form as shown trough the Task Analysis (2007) and the current Discrete Item Analysis.

If making small additions/improvements to the PARE in its present form, the RCMP could consider replacing the weight lift and carry with a Mannequin Drag, and adding an Arm Restraint section as a separate item (a pass/fail item after the push and pull). Neither of these items would change the 4:00 criteria, and the distance and techniques for pass and fail could be developed independent of the criterion time.

Other considerations may also be given to research projects to further study the physical demands of police work (such as having to struggle with an uncooperative subject); to examine the weight of the push/pull in relation to the forces required during a struggle with an uncooperative suspect (although changing the weight would require a new criterion score (time) be developed); any potential adverse impact of the PARE on specific groups (age, gender, culture, weight, height); re-defining the criterion score of 4:00 minutes; or the development of other tests for specialized units performing duties beyond the one identified in the PARE Task analysis 2007.

References

Anderson, G.S. and Plecas, D.B. (2007). *Physical Abilities Requirement Evaluation (PARE): Phase 1: Task Analysis*. RCMP, Learning and Development, Ottawa, ON.

Anderson, G.S., and Plecas D. (1999), *The Physical Abilities Required for General Duty Work in British Columbia's Municipal Police Forces: Re-validating the Police Officers' Physical Abilities Test***,** Justice Institute of British Columbia, New Westminster, B.C., Canada.

Anderson, G.S., D.B. Plecas, and R. Litzenberger. Physical evidence of police officer stress. *Policing: An International Journal of Police Strategies & Management*. 25: 399-420, 2002.

Anderson, G.S., D.B. Plecas and T. Segger. Police officer physical abilities testing: Re-validating a selection criterion. *Policing: An International Journal of Police Strategies & Management*. 24(1): 8-31, 2001.

Bonneau, J. (1988), *Task analysis RCMP: Surrey and rural studies,* RCMP Health Services Directorate, Ottawa, Ontario.

Bonneau, J. (1990), *Physical Ability Requirement Evaluation: Protocol and Instructions,* RCMP Health Services Directorate, Ottawa, Ontario.

Bonneau, J. (1996), *PARE Standard Summary,* RCMP Health Services Directorate, Ottawa, Ontario.

Bonneau, J. (1994), Occupational Fitness. IN: Trottier, A., Brown, J. (editors). Police Health: A Physician's Guide for the Assessment of Police Officers. Canada Communication Group.

Bonneau, J., and Brown, J. (1995). Physical ability, fitness and police work@, *Journal of Clinical Forensic Medicine,* Vol. 2, pp. 157-164.

Brownlie, L., Brown, S., Diewert, G., et al. (1985), Cost-effective selection of fire fighter recruits, *Medicine and Science in Sports and Exercise*, Vol. 17 No. 6, pp. 661-666.

Campion, M.A. (1983). Personnel selection for physically demanding jobs: review and recommendations. Personnel Psychology, 36:527-550.

Deakin, ZJ.M., Smith J.T., Pelot R., and Weber C.L. (2001). Methodological considerations in the development of physical maintenance standards. IN: Gledhill, N., Bonneau, J, and Salmon, A. (Eds). Proceedings of the National Forum on Bona Fide Occupational Requirements. Toronto, ON.

Dunsmore, R.R. and Hunter, A.J. (2001). Manoeuvering the obstacle course: Implementing incumbent physical fitness testing in the workplace. IN: Gledhill,

N., Bonneau, J, and Salmon, A. (Eds). Proceedings of the National Forum on Bona Fide Occupational Requirements. Toronto, ON.

Eid, E. (2001). Challenges posed by the Supreme Court of Canada in the Meoirin decision to employers in physically demanding occupations. IN: Gledhill, N., Bonneau, J, and Salmon, A. (Eds). Proceedings of the National Forum on Bona Fide Occupational Requirements. Toronto, ON.

Evans, D.H. (1980), Height, weight, and physical agility requirements - Title VII and public safety employment, *Journal of Police Science and Administration*, Vol. 8 No. 4, pp. 414-436.

Farenholtz, D.W., and Rhodes, E.C. (1986), Development of physical abilities test for municipal police officers in British Columbia, *Canadian Journal of Applied Sport Sciences*, 11(3), abstract.

Farenholtz, D.W., and Rhodes, E.C. (1985), Development of physical abilities test for correctional officers in British Columbia. Presented to the Canadian Association of Sports Sciences.

Farenholtz, DW, and EC Rhodes (1990) Recommended Canadian standards for police physical abilities. Canadian Police College Journal. 14(1):37-49.

Gaul, C.A., and Wenger, H.A. (1992), *RCMP physical abilities requirement evaluation demonstration project: Final report.* RCMP Health Services Directorate, Ottawa, Ontario.

Girard, G. and RCMP Division Fitness and Lifestyle Advisors (2003) PARE National Survey 1998-2002. RCMP Health Services Directorate, Ottawa, Ontario.

Gledhill, N., Jamnik, V.K. & Shaw, J (2001). Establishing a Bona Fide Occupational Requirement for physically demanding occupations. In Gledhill, N., Bonneau, J. & Salmon, A. (Eds.). *Proceedings of the National Forum on Bona Fide Occupational Requirements* (pp. 9-13). Toronto, Ontario: York University.

Greenberg, G.J., and Berger, R.A. (1983), A model to assess one=s ability to apprehend and restrain a resisting suspect in police work, *Journal of Occupational Medicine*, Vol. 25 No. 11 pp. 809-813.

International Association of Chiefs of Police (1998), IACP 1987 annual law enforcement survey: Executive summary, *The Police Chief*, January, pp. 38-43.

Leger, L. (2004). QUEBEC: TAP-ENPQ (Test d'Aptitudes Physiques – École Nationale de Police du Québec). Fit for Life -Fit for Duty National Conference, Ottawa ON.

Lonsway, K.A. (2003). Tearing down the wall: Problems with consistency, validity, and adverse impact of physical agility testing in police selection. Police Quarterly, 6(3):237-277.

Loree, D.J. (1995), *Violent Incidents*, CCAP RCMP Internal Report, Ottawa, Ontario.

Ontario Ministry of Public Safety and Security (2002). Technical Guide for Users of the Physical Readiness Evaluation for Police. Queens Printer for Ontario, Toronto, Ontario.

Sommerfeld, H., Dunlop, B., Neary, J.P. (1998). Heart rate responses during the R.C.M.P. PARE test. Can J Appl Physiol 23(5):509.

Rayson, M (1998). The development of physical selection procedures. Phase 1. Job analysis. *Contemporary Ergonomics*. 393-397.

Reilly, R.R., Zedeck, S., and Tenopyr, M.L. (1979), Validity and fairness of physical ability tests for predicting performance in craft jobs, *Journal of Applied Psychology*, Vol. 64 No. 3, pp. 262-274.

Rhodes, E.C., and Farenholtz, D.W. (1992), Police officer=s physical abilities test compared to measures of physical fitness, *Canadian Journal of Sport Science*, Vol. 17 No. 3, pp. 228-233.

Sothmann, M.S., Gebhardt, D.L., Baker, T.A., Kastello, G.M. and Sheppard, V.A. (2004). Performance requirements of physically strenuous occupations: validating minimum standards for muscular strength and endurance. *Ergonomics, 47*(8), 864-875.

Superko, R.H., Bernauer, E., and Voss, J. (1988), Effects of a mandatory health screening and physical maintenance program for law enforcement officers, *The Physician and Sports Medicine*, Vol. 16 No. 9, pp. 99-109.

Taylor, N.A.S. and Groeller, H. (2003). Work-based physiological assessment of physically-demanding trades: a methodological overview. J. Physiological Anthropology. 22(2):73-81.

Wilmore, J.H., and Davis, J.A. (1979), Validation of a physical abilities field test for the selection of state traffic officers, *Journal of Occupational Medicine*, Vol. 21 No. 1, pp. 33-40.

Appendix A

Regular Member Survey

Appendix B

Explanation of Modification:
Summary of Comments

Matt Jump: Explanation of Modification
Summary of Comments

Comments	Frequency
Comments referring to shorter matt jump (34) Shorten (30) Shorter; 4' (4)	**34.7%**
Comments referring to longer matt jump (30) Longer (23) Longer (7)	**30.6%**
Comments referring to less/no matt jumps (22) Do not need; remove (17) Fewer jumps (3) Take out 'clients' don't run and jump over 5' creeks (1) Two times (1)	**22.4%**
Comments referring to more matt jumps (5) Add another mat jump in the course (3) Add another one (1) Do plenty if you touch the mat (1)	**5.1%**
Comments referring to relevancy of matt jumps (3) I have never jumped over a mat or puddle (1) More likely to run through creeks (1) What does it matter how a person gets across the ditch (1)	**3.1%**
Other comments (4) Mat jumps and low hurdles favour taller member (1) This or hoop drill (1) Add 15 sec for age 45+ unless ERT or Tact troop Wear uniform (1)	**4.1%**
Total number of comments (98)	

11.6% of 844 participants added comments to this section
* Equal number (30.6% of respondents) considered lengthening and shortening the Mats

Vault: Explanation of Modification
Summary of Comments

Comments	Frequency
Comments referring to increase height (70) Higher; increase height (45) Make it simulating climbing a fence (8) 5' - 6' yard fence (7) Change into a climb (2) We often go over 6' fences. One vault should be that high (1) Fences are higher sometimes it is possible to go underneath (1) Height should represent 6 to 8 foot fence (1) Higher like scaling a brick wall (1) Higher. Climb up on and over. Fences are not that low (1) Increase height, land only on feet (1) Little higher, more stable apparatus (1) Make it higher to simulate typical chain fence (1)	**73.7%**
Comments referring to relevancy/frequency (12) No need; not relevant (7) Not needed on every lap (5)	**12.6%**
Comments referring to decreased height (10) Too high; should be lower (9) Make lower for short people (1)	**10.5%**
Other comments (4) Same height no falls or other side (1) Add 15 sec for age 45+ unless ERT or Tact troop (1) Wear uniform (1)	**3.2%**
Total number of comments (95)	

11.4% of 844 participants added comments to this section
* 71 of 96 (74%) included increasing height

Controlled Falls: Explanation of Modification
Summary of Comments

Comments	Frequency
Comments referring to fewer/no falls (69) Fewer (32) Eliminate (29) Get rid of the falls between the push/pull (7) Rationale? too many between push pull and after every lap of circuit (1)	**75.8%**
Comments on technique required for of falls (9) Not likely to control as much as chest down or shoulders touching (3) Fall either way (1) Falls are not controlled in the field (1) Just get down and up as fast as you can (1) Should be able to swing legs to get up (1) Should be able to use one foot in lieu of two (1) Why would we do a controlled fall (1)	**9.9%**
Comments on relevancy of falls (5) If I fell that many times chasing someone they are already gone (3) More realistic to keep running after hurdle (1) Too many members do not fall that often unless in ground fight (1)	**5.5%**
Comments referring to more falls (4) More controlled falls Add a fall after the mat jumps	**4.4%**
Other comments (4) Again the purpose is to simulate being knocked down? (1) Use wall for controlled fall rather then push/pull machine (1) Add 15 sec for age 45+ unless ERT or Tact troop (1) Wear uniform (1)	**4.4%**
Total number of comments (91)	

10.8% of 844 participants added comments to this section
* 85 of 91 (93.4%) questioned controlled falls

Low Hurdles: Explanation of Modification
Summary of Comments

Comments	Frequency
Comments referring to increased height (35) Increase height (35)	**38.0%**
Comments referring to fewer/no hurdles (27) Eliminate (21) Too many (4) Fewer hurdles (2)	**29.3%**
Comments referring to more hurdles (13) Add additional (13)	**14.1%**
Comments referring to hurdles placement or construction (8) Make wider; more space (4) Make more solid and wide so that member could stand or step on it (1) Move closer (1) Put in a further distance to run (1) One low then one high hurdle (1)	**8.7%**
Comments referring to lower height (5) Lower (5)	**5.4%**
Other comments (4) Very few obstructions in reality (1) Shorter members are required to use more endurance to complete (1) Add 15 sec for age 45+ unless ERT or Tact troop (1) Wear uniform (1)	
Total number of comments (92)	

10.9% of 844 participants added comments to this section
* 35 of 96 (38%) included increasing height

Stairs: Explanation of Modification
Summary of Comments

Comments	Frequency
Comments referring to more steps (51) More steps (51)	**60.0%**
Comments referring to fewer steps (21) Fewer; decrease by 1-3 steps (16) Every second lap; fewer times (4) Too many times (1)	**24.7%**
Comments referring to stairs placement or construction (9) Sturdy hand rails (4) Needs ramp (1) No ramp (1) One long one (1) Steps need to be fatter (1) Up at one end of PARE, down at other end (1)	**10.6%**
Comments on technique required for of falls (2) Why does technique matter (1) Get rid of rule saying you must touch 2 stairs (1)	**2.4%**
Other comments (2) Add 15 sec for age 45+ unless ERT or Tact troop (1) Wear uniform (1)	**2.4%**
Total number of comments (85)	

10.1% of 844 participants added comments to this section
* 51 of 85 (60%) included more steps

Run Length: Explanation of Modification
Summary of Comments

Comments	Frequency
Comments referring to longer run length (36) Longer (34) Slightly longer, less turns, more, longer stretches (2)	**51.4%**
Comments referring to shorter run length (18) 4-5 laps (9) Shorten run; Too long (8) My experience has been that foot chases are shorter (1)	**25.7%**
Comments referring to modification of obstacle course (10) Longer run in the beginning ; laps then circuit (3) Add a sprint (2) Should be more duty orientated (2) 3 laps, longer course (1) Modify course (1) Same length but no repetition of obstacles (1)	**14.3%**
Other comments (6) Don't go longer. 5-6 is okay (1) Increase time (1) I never had the PARE cough after a real chase (1) Add 15 sec for age 45+ unless ERT or Tact troop (1) Shorter but done in full uniform (1) In uniform (1)	**8.6%**
Total number of comments (70)	

8.3% of 844 participants added comments to this section
* 41 (59%) of the comments are related to increasing length

Push: Explanation of Modification
Summary of Comments

Comments	Frequency
Comments referring to increase weight (30) Add weight; 10 – 30 pounds (30)	**41.7%**
Comments referring to less/no weight (15) Less weight (10) Delete (3) Modify weight to lower weight for women (2)	**20.8%**
Comments referring to modification to push component (17) Height adjustable equipment (7) Add a couple more arcs (3) Not as many arcs (3) Make % of own mass to push themselves away and not the other person or do away with (1) Modify to simulate a fight while standing that transitions to a ground fight (1) Push a weight over a distance (1) More push and less pull (1)	**23.6%**
Comments on technique required for push (2) Form should not be a factor (1) Pushing in an arc unusual push (1)	**2.8%**
Other comments (8) Eliminate/reduce controlled falls (2) Not simulative of an actual struggle (1) A take down (1) Should be part of re-cert like sidearm (1) Slippery floor (1) Add 15 sec for age 45+ unless ERT or Tact troop (1) Wear uniform (1)	**11.1%**
Total number of comments (72)	

8.4% of 844 participants added comments to this section
* three times as many suggest adding weight as compared to lowering weight

Pull: Explanation of Modification
Summary of Comments

Comments	Frequency
Comments referring to increase weight (41) Add more weight (5 – 75 pounds) (40) Way to light if I want someone dragging my body out of a building should be 250 lbs (1)	**56.9%**
Comments referring to modification to pull component (11) Height adjustable equipment (4) Too many reps or arcs (3) Less pull and more push (1) Modify to simulate a fight while standing that transitions to a ground fight (1) Pull a weight over a distance (1) Longer (1)	**15.3%**
Comments referring to less/no weight (8) Too heavy; less weight (4) Remove (3) Too heavy for females due to size (1)	**11.1%**
Comments on technique required for pull component (4) Form should not be a factor (1) Less structure (1) Pulling in an arc is an unusual pull (1) Never pull in that manner (1)	**5.6%**
Other comments (8) Eliminate/reduce controlled falls (3) Should be part of re-cert like sidearm (1) Slippery floor (1) Add 15 sec for age 45+ unless ERT or Tact troop (1) Wear uniform (1) Unsure (1)	**11.1%**
Total number of comments (72)	

8.4% of 844 participants added comments to this section
* 41 of 71 (58%) suggest adding weight

Weight Carry: Explanation of Modification
Summary of Comments

Comments	Frequency
Comments referring to increase weight or effort (130) Body simulation; dummy drag (47) Increase weight (37) Longer (27) Add weight and length of carry (12) Increase weight to something real (3) Make it more job related; real person (3) Heavier (and over the shoulder) (1)	**68.8%**
Comments referring to less/no weight or effort (25) Not necessary; eliminate (19) Lighter weight (4) Too long (2)	**13.2%**
Comments on technique required for Weight Carry (21) Allow any carry method; fireman's carry (20) (Heavier and) over the shoulder (1)	**10.6%**
Comments referring to modification to Weight Carry Section (8) Less recovery time (4) Part of timed PARE (2) Should have to complete weight after each lap (1) Adding obstacles on stairs (1)	**4.2%**
Other comments (5) Test is fine the way it is (1) Bad guy should move himself or other members will help (1) Use rough surface (1) Add 15 sec for age 45+ unless ERT or Tact troop (1) Wear uniform (1)	**2.6%**
Total number of comments (189)	

22.3% of 844 participants added comments to this section
* Extreme variation in responses

Appendix C

Summary of Proposed Additions and Deletions to the PARE

Are there any physical elements related to your job that you would like to see added to the PARE?

Comments	Frequency
Complete in equipment (uniform, vest, duty belt)	23 (17.8%)
Traditional exercises (push up, pull up, sit up, bench press)	14 (10.8%)
Add a stress element (verbal, multitask, manipulative)	11 (8.5%)
Shooting	9
Climb over a fence or wall	8
Longer run 2-5 km (could be separate)	6
Add a body drag portion	5
A 20-100m sprint	5
Punching and striking	5
Crawl	4
I enjoy the PARE as is	4
Add a weight component to simulate the heavy equipment	3
Application of handcuffs & calling into OCC for update; post fight	3
Fighting	3
Speaking and commands	3
Endurance run	2
Swimming for duration	2
Alternative performance standards need to be developed for different units	2
Add fine motor skill right after the timed portion to show thinking skills under physical stress	1
Add more rounds	1
Agility tire rings	1
Improve info for regular members to prepare them. Even with exercise it was difficult mid career	1
Make the weight carry part of the timed event	1
Memory and verbal response portions to test controlled aggression and cognitive skills and thinking	1
Paper work and typing segment	1
Pushing through a crowd	1
Simulate extreme temperatures	1
Sitting at a desk/car for prolonged periods of time	1
Speed writing to complete the huge amount of forms	1
Steering a P.C. with your knee with a Timmy's coffee in one hand and mic in other	1
The physical elements done day to day never done falls	1
Uneven ground	1
Using a shoulder as kicking in a door	1
Hand grip levels	1
Total number of comments	**129**

What one element would you absolutely delete from the PARE?

	Frequency
Controlled Falls	47 (30.1%)
Low Hurdles	24 (15.4%)
Weight bag carry	20 (12.8%)
Mat Jumps	17 (10.9%)
Push/Pull	17 (10.9%)
Vault	6
6 laps over stair case. should be one or two long one	5
PARE cough	4
Number of laps	2
Time limit	2
4 minute time limit for age 45+	1
Extended time	1
I think all elements are relevant & important to PARE would not delete any	1
Length	1
Less turns	1
Nothing	1
Possibly raising blood pressure entry and exit	1
Pylons	1
Remove added 45 seconds in applicants	1
Remove time component unless in specialized unit	1
Resting time between laps and weight carry	1
The PARE evaluates my physical fitness the best	1
Total number of comments	**156**