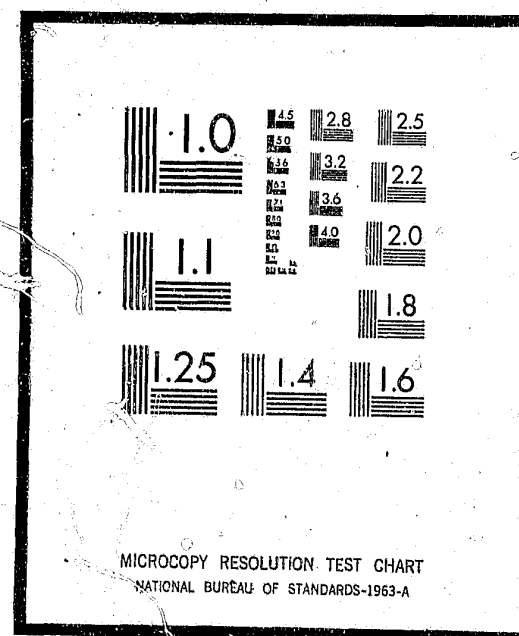


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## THE MARKET POTENTIAL FOR LIGHTWEIGHT ROUTINE DUTY BODY ARMOR

Conducted On Behalf Of:

THE AEROSPACE CORPORATION

By

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## INTRODUCTION

### Background

The Aerospace Corporation, under a prime contract with the Law Enforcement Assistance Administration, is participating in the development of new and/or improved crime prevention techniques and equipment systems for use by law enforcement and criminal justice agencies. It is expected that the products developed under the government program will be made available for commercial manufacture and sale. A general assessment of the potential market for these products is required.

The three products and services included in the series of studies conducted by Tyler Research Associates, Inc. are:

- 1) A low cost burglary alarm system - A burglary alarm for use in residences and small businesses which signals a burglar's presence audibly, covertly to a response agency, or a combination of the two.
- 2) A citizen's alarm system - A personal alarm actuator, in the size and shape of a wristwatch or pendant, can be used to summon aid in the event of a criminal act, or other emergency, within a geographic area having the required receiver network. Actuation identifies the user and his location for response agent action (police, security guards, etc.).
- 3) Lightweight body armor - A soft body armor for protection of law enforcement personnel. The armor is made from a synthetic fiber, fashioned into various articles of lightweight clothing which can defeat a .38 caliber handgun and other threats of equal or less severity.

Products #1 and #2 are believed to have market potential among the general public and small businesses. Product #3 is designed for use by law enforcement officials.

This report presents the findings from a study of the market potential for the lightweight body armor. Findings from studies concerned with the low cost burglary alarm system and the citizen's alarm system are presented under separate cover.

### Objectives

The overall objective of the study was to assess the market potential for lightweight body armor made of Kevlar. Specific objectives were to:

- . Examine current usage of lightweight body armor;
- . Obtain reactions to lightweight body armor made of Kevlar;
- . Determine the types of applications potential consumers perceive for the Kevlar body armor;
- . Explore the market potential for which the product is intended;
- . Project -- on a preliminary basis -- the potential annual sales volume for the various Kevlar garments.

## METHODOLOGY

### General Sample Design

As an initial step in sample design, one Standard Metropolitan Statistical Area was drawn from each of the nine U.S. Census regions:

<u>Census Region</u>	<u>S.M.S.A.</u>
. New England	. Boston, Massachusetts
. Middle Atlantic	. Paterson-Clifton-Passaic, New Jersey
. East North Central	. Chicago, Illinois
. West North Central	. Kansas City, Missouri - Kansas
. South Atlantic	. Charlotte-Gastonia, North Carolina
. East South Central	. Nashville-Davidson, Tennessee
. West South Central	. Dallas, Texas
. Mountain	. Denver-Boulder, Colorado
. Pacific	. San Francisco-Oakland, California

Sample S.M.S.A.'s were selected on two bases:

- . Not being an area where field testing of the light-weight body armor is currently being conducted, and
- . Having a high total crime index.\*

Among the nine sample S.M.S.A.'s, the area having the highest total crime index was San Francisco/Oakland, at 7,277.8, and the lowest was Nashville/Davidson, at 4,021.0.

\*Crime In The United States, 1973, Federal Bureau of Investigation, Uniform Crime Reports.

#### Sample Composition

The most logical non-military market for lightweight body armor was agreed to be among law enforcement agencies, private security agencies, and private armored transport services.

A total of 107 interviews were conducted nationwide with officials in such agencies who have purchasing authority or influence for products such as lightweight body armor.

The interviews, divided equally among the nine S.M.S.A.'s, were distributed as follows:

- . 10 State Law Enforcement Agencies
- . 47 County Law Enforcement Agencies
- . 46 Municipal Law Enforcement Agencies
- . 10 State and County Prisons
- . 19 Private Security Services
- . 5 Private Armored Car Services

#### Interviewing Procedures

All respondents were interviewed face-to-face in their offices. The personal, in-office interview technique was utilized to allow respondents to make a personal examination of the Kevlar material and related exhibits, and to discuss their reactions to the product face-to-face with a Tyler Research Associates, Inc. interviewer. Interviews averaged 30 to 45 minutes in length. All interviewing was conducted during July, 1975.

#### Weighting Procedures For Potential Market Projections

To provide an approximation of the market potential for Kevlar in terms of annual sales, a weighting factor was applied to interviews conducted within each agency category to allow these interviews to represent the total number of such agencies nationwide.

The following procedures were used to calculate the weighting factors applied to each respondent:

- . The figures below were agreed to be reasonable approximations of the total number of appropriate agencies nationwide:\*
- State Law Enforcement Agencies -- 200
- County Law Enforcement Agencies - 3,383
- Municipal Law Enforcement Agencies - 14,444
- State/County Prisons - 3,630
- Private Armored Car Services - 345
- Private Security Services - 1,197;
- . For each category, the total number of agencies was divided by the number of interviews conducted in that category;
- . The quotient became the weighting factor for interviews within that category;
- . Purchase estimates given by each respondent were multiplied by the weighting factor for that category.

The reader should bear in mind that the total and individual category sample sizes utilized in this study are too small to consider the sales projections derived in this process as other than gross estimates.

#### In Conclusion

We would like to acknowledge the fine cooperation and help given us by members of The Aerospace Corporation project team throughout this study. In particular, we wish to express our appreciation to Mr. R.R. Bales, Materiel Department; and to Mr. Walter R. Preysnar, and Dr. John P. Johnson of the Law Enforcement and Telecommunications Division.

\*The sources for these figures appear in the Appendix to this report.

As stipulated by the Code of Ethics of the American Association of Public Opinion Research, we are required to maintain the anonymity of all respondents. No information can be released that in any way will reveal the identity of a respondent. Also, our authorization is required for any publication of research findings or their implications.



## SUMMARY

### Underlying Need For The Product

More than seven officials in ten (75%) from law enforcement agencies, prisons, and private security services believed that assaults on police and other security officers are on the rise. More than three in ten (35%) believed that such assaults have increased a great deal during the last five years, and four in ten (40%) believed that they have increased slightly.

### Current Usage Of Routine Duty Body Armor

A majority of the agencies currently issue various types of ballistic protective items, but fewer than two agencies in ten (17%) issue routine duty body armor.

High vulnerability organizations -- defined as those where 61% or more of their personnel operate under threat of violence, and whose officials said that assaults on their men have increased a great deal during the last five years -- were substantially more likely to have already ordered, or to intend to order, lightweight body armor.

A substantial proportion (47%) of the body armor these agencies use, or have on order, was reported to be made of various types of synthetic fabric, including nylon and Kevlar.

Most agencies which currently do not issue routine duty body armor do not see a need for the product. Other reasons for not using it relate to: funding difficulties; the bulkiness of body armor; the belief that it is too hot to wear comfortably.

The great majority of these agencies which do not issue, or do not plan to issue, routine duty body armor said that their personnel are free to purchase it with their own funds.

Among those who currently issue or plan to issue routine duty body armor, the most common use of the product is for auto patrol. More than six in ten of these officials said they use it for this activity, both during the day, and at night. More than five in ten said they use it for tactical squad activities.

At lower levels, the following uses were mentioned by those who issue or plan to issue routine duty body armor: detective work (38%); foot patrol, day (30%); foot patrol, evening (27%); motorcycle patrol (27%); desk sergeant, etc. (12%); jail/prison guard (12%).

Body armor is currently more frequently used in special situations, rather than on a routine basis. For only three applications was it reported to be used somewhat more frequently on a routine basis than on a situational basis: auto patrol, evening; auto patrol, day; motorcycle patrol.

Current levels of satisfaction with routine duty body armor are low. Only about one agency in ten (11%) now using it said they were "very satisfied" with it. An additional five in ten (50%) said they were "somewhat satisfied." Most of the expressed dissatisfaction, however, related to the older, heavier, and bulkier types of armor.

The primary complaint voiced by the few using the new, lightweight type was the question of whether stopping power is adequate.

#### Attributes Necessary To Induce Purchase Recommendation

The ways in which respondents described the "ideal" routine duty body armor relate to two major areas of concern -- wearability and protective ability. These were the two most frequently mentioned features necessary for these officials to recommend purchase of routine duty body armor.

Wearability of the armor refers to comfort, inconspicuousness, a minimum of interference with movement, being light in weight, and having that weight well-distributed.

There were many specific concerns about protection, and a substantial proportion of those who did talk about protective ability mentioned the desirability of the armor's stopping more powerful calibers such as: .357 magnum; .44; 9MM; and rifle bullets.

Cost was infrequently mentioned as an important consideration in purchase recommendation.

#### Awareness Of The Product Class -- Routine Duty Body Armor

Claimed awareness of the product class -- routine duty body armor made of woven synthetic fabric -- was high. Eight in ten (81%) said they have seen or heard about it.

Respondents had learned about routine duty body armor from a diversity of sources, including: manufacturers' representatives; law enforcement meetings; stores; police magazines; and conversations with other law enforcement officers.

Respondents' impressions of the new routine duty body armor were quite positive. The most frequently mentioned specific positive impressions were: its lightweight quality (20%); its ability to prevent bullet penetration (14%); its ability to save lives (10%).

No negative impressions were mentioned by even one respondent in ten. The most frequently mentioned negative reactions were: concern with blunt trauma effect (7%); its making the wearer too hot (7%); its protection being limited to low caliber bullets (6%); a belief that it is not comfortable enough for all-day wear (6%).

Awareness of the product class has so far not led to majority purchase interest. Only one in ten (10%) has ordered it so far, and an additional two in ten (21%) said they intend to order it.

The principal reason given by those who do not intend to order such products is that they perceived no need for them. The two other principal reasons related to cost considerations and a desire to wait for further testing.

#### Attitudes Toward Kevlar And Kevlar Garments

After respondents had read a factual description of Kevlar and its characteristics, had seen pictures of the material made up into various uniform and civilian garments, and had examined a 12" by 12" swatch of the material itself, they were asked their impression of the product.

Reaction to Kevlar and its characteristics was very positive. Better than eight respondents in ten rated it an excellent (21%) or a good (56%) product. Only one in ten (10%) rated Kevlar a fair product. 1% rated it a poor product.

There was substantial spontaneous positive response to Kevlar. Many of the specific positive aspects mentioned by respondents were the same as those which they had earlier described as being important in their recommending purchase of a routine duty body armor product.

Virtually all respondents (94%) liked something about the Kevlar product. The most frequently mentioned positive product characteristic was lightness. Six in ten (62%) were favorably impressed with the lightness of the Kevlar product.

Other less frequently mentioned positive reactions were to Kevlar's:

- . Pliability (17%);
- . Apparent wearability and probable comfort (17%);
- . Good stopping power (17%);
- . Lack of bulk (16%);
- . Probable inconspicuousness (15%);
- . Washability (11%);
- . Lack of hindrance of movement (10%).

Although negative reactions to Kevlar were considerably less frequent than positive reactions, seven in ten (74%) disliked something about the Kevlar product.

The most frequent criticism of Kevlar related to the idea that Kevlar garments would be too warm (24%). The only other negative reaction to the product mentioned by more than one in ten was the idea that the product offered protection only from smaller caliber handguns (14%).

#### How Kevlar Garments Would Be Used

If Kevlar products were available, substantial proportions of law enforcement agencies, prisons, and private security services intend to use it for a variety of activities:

- . Auto patrol, evening (71%);
- . Auto patrol, day (52%);
- . Detective (44%);
- . Tactical squad (44%);
- . Foot patrol, evening (32%);
- . Foot patrol, day (24%);
- . Motorcycle patrol (21%);
- . Jail/Prison guard (15%);
- . Desk sergeant, etc. (9%);
- . Guards (other) (3%);
- . K-9 Corps (2%).

For most of the activities for which these agencies visualize using Kevlar garments, they are more likely to use them on a routine basis than only for special situations. The activities for which there was a relatively strong predisposition to use the Kevlar garments routinely were:

- . Auto patrol, evening;
- . Auto patrol, day;
- . Foot patrol, day;
- . Motorcycle patrol.

#### Purchase Interest In The Prototype Kevlar Garments

There was purchase interest in virtually every one of the nine prototype Kevlar garments. Every respondent was shown photographs of policemen wearing each of the nine Kevlar garments and a price list showing the estimated cost for each of the items. He was then asked which, if any, of the nine garments his (force) (company) would be likely to purchase over the next several years.

The following proportions of officials said they intend to purchase each of the types of Kevlar garments for their agencies over the next several years:

- . Undershirt (42%);
- . Dress vest (23%);
- . Vinyl patrol jacket (15%);
- . Sport coat (9%);
- . Cloth jacket (6%);
- . Trooper coat (6%);
- . Motorcycle jacket (5%);
- . Officer's coat (2%);
- . Scooter coat (.5%).

Among those respondents with no purchase interest in any Kevlar garment, the most frequent reason for not being interested was the belief that they are too expensive (35%). Between two and three in ten (26%) said their agency has no need for the products. Almost two in ten (18%) have no budgeted funds to buy the garments. About one in ten was not interested because: the products are not proven yet (9%); their officers have an allowance which would permit them to purchase their own (9%).

#### Potential Sales Projections For Kevlar Garments

Projecting the data from the sample to all such agencies nationwide suggests the possibility of a substantial first year sales potential for Kevlar garments -- on the order of \$280,000,000 for all nine garments.

Projected annual replacement sales potential for the Kevlar garments is also high -- approximately \$100,000,000 per year for all garments.

Possible Counterproductive Effects From The Use Of Kevlar Garments

There was some thought that, despite its great advantages, routine duty body armor may have some counterproductive effects.

A majority of officials agreed that:

- . In a short time, criminals would also acquire the lightweight body armor (67%);
- . Once criminals become aware that the authorities are wearing body armor, they'll begin to use higher threat weapons or to aim for the head (62%);
- . Widespread armor usage by the authorities could lead to a false sense of security on their part (61%).

CHAPTER I

BELIEFS CONCERNING THE TREND OF ASSAULTS  
ON POLICE AND OTHER SECURITY OFFICERS



OFFICIALS FROM LAW ENFORCEMENT AGENCIES, PRISONS, AND PRIVATE SECURITY SERVICES ALL BELIEVED THAT ASSAULTS ON POLICE AND OTHER SECURITY OFFICERS ARE ON THE RISE.

Overall, more than three in ten (35%) believed that such assaults have increased a great deal during the last five years, and four in ten (40%) believed that they have increased slightly.

Only 25% said that such assaults have stayed the same or have decreased during the last five years.

"As far as you know, in the past 5 years, have assaults on police and other security officers in your (city), (county), (state):"

	<u>All Agencies</u>
Percentage Base:	(107)
Increased a great deal	35%
Increased slightly	40
Stayed the same	17
Decreased slightly	5
Decreased a great deal	3
Don't Know/No Response	1



CHAPTER II

CURRENT USAGE OF, AND ATTITUDES TOWARD,  
"ROUTINE DUTY" BODY ARMOR

ALTHOUGH A MAJORITY OF RESPONDENTS SAID THEIR AGENCIES CURRENTLY ISSUE VARIOUS TYPES OF BALLISTIC PROTECTIVE ITEMS, FEWER THAN TWO AGENCIES IN TEN (17%) REPORTED CURRENTLY ISSUING ROUTINE DUTY BODY ARMOR.

The most frequently issued items were flak jackets and other special situation body armor (46%) and ballistic helmets (37%).

Other ballistic protective items currently issued were:

- . Hand-held ballistic shields (12%);
- . Patrol car armor (9%);
- . Special armored cars (6%);
- . Riot helmets (6%).

Only 26% of all agencies interviewed do not issue any ballistic protective items.

"On this card are different types of ballistic protective items. Which, if any, does your (force) (company) now issue?"

	All Agencies	Law Enforcement Agencies			State/ County Prisons	Security Services	Armored Car Services
		State	County	Municipal			
Percentage Base:	(107)	(10)	(17)	(46)	(10)	(19)	(5)
Flak jackets and other special situation body armor	46%	70%	53%	59%	60%	-%	-%
Ballistic helmets	37	50	18	46	80	16	-
Routine duty body armor	17	10	6	28	20	5	-
Hand-held ballistic shields	12	20	24	7	40	-	-
Patrol car armor	9	10	6	11	20	-	20
Special armored cars	6	10	-	-	10	-	80
Riot helmets/Helmets	6	-	6	7	-	11	-
Others	7	10	-	4	30	-	-
Do not issue any ballistic protective items	26	10	29	15	10	74	-

BETWEEN SEVEN AND EIGHT AGENCIES IN TEN (76%) SAID THEY HAVE NO PLANS TO ISSUE ANY OTHER BALLISTIC PROTECTIVE ITEMS IN THE NEAR FUTURE.

Among those who did mention such intentions, routine duty body armor (15%) was the most frequently mentioned item which agencies were planning to issue.

"What others, if any, are you planning to issue in the near future?"

	All Agencies	Law State	Enforcement County	Agencies Municipal	State/ County Prisons	Security Services	Armored Car Services
Percentage Base:	(107)	(10)	(17)	(46)	(10)	(19)	(5)
Routine duty body armor	15%	10%	18%	17%	20%	11%	-
Flak jackets and other special situation body armor	4	10	-	4	-	-	20
Hand-held ballistic shields	3	-	12	2	-	-	-
Ballistic helmets	2	-	-	2	-	5	-
Riot helmets/Helmets	1	-	-	2	-	-	-
Patrol car armor	-	-	-	-	-	-	-
Special armored cars	-	-	-	-	-	-	-
Others	1	-	-	2	-	-	-
Do not plan to issue any other ballistic protective items	76	80	71	70	80	90	80

HIGH VULNERABILITY ORGANIZATIONS WERE SUBSTANTIALLY MORE LIKELY TO HAVE ALREADY ORDERED, OR TO INTEND TO ORDER, LIGHTWEIGHT BODY ARMOR.

As shown opposite, high vulnerability organizations were defined as those:

- . Where 61% or more of their personnel operate under threat of violence, and;
- . Whose officials said that assaults on their men have increased a great deal during the last five years.

Low vulnerability organizations were those:

- . Where less than 61% of their personnel operate under threat of violence, and;
- . Whose officials said that assaults on their men have not increased a great deal during the last five years.

High Vulnerability Organizations

Low Vulnerability Organizations

Officials Who Say:

Officials Who Say:

a. 61% or more of personnel operate under threat of violence

a. under 61% of personnel operate under threat of violence

b. assaults have increased a great deal in last 5 years

b. assaults have not increased a great deal in last 5 years

Percentage Base:

(19)

(12)

Have already ordered or intend to order lightweight body armor

42%

16%

Have not ordered or do not intend to order lightweight body armor

58%

84%

NOTE: Given the small number of cases available for this analysis, it is understood that the data are suggestive only. They are given added weight, however, by other findings of this study as detailed in later pages.

A SUBSTANTIAL PROPORTION (47%) OF THE ROUTINE DUTY BODY ARMOR THESE AGENCIES USE OR HAVE ON ORDER WAS REPORTED TO BE MADE OF NYLON, KEVLAR, OR OTHER SYNTHETIC FABRIC.

Some was made of metal (12%) and other materials (21%), and some respondents did not know what material their agencies' routine duty body armor was made of.

\*\* 12 \*\*

"What type of routine duty body armor is that? That is, what type of material is it made from? (PROBE) Is it made from metal or some other kind of material?"

	Forces/Companies Which Issue Or Plan To Issue Routine Duty Body Armor
Percentage Base:	(34)
Metal	12%
Kevlar	9
Nylon	29
Synthetic fabric	9
Others	21
Don't Know/No Response	27

\*\* 13 \*\*

AMONG AGENCIES WHICH CURRENTLY DO NOT ISSUE ROUTINE DUTY BODY ARMOR, THE PRINCIPAL REASON GIVEN FOR NOT DOING SO WAS PERCEIVED LACK OF NEED FOR THE PRODUCT.

Most of these agencies said that their situation simply did not require routine duty body armor.

Other reasons, at much lower levels of mention, were:

- . Funding difficulties;
- . The bulkiness of the body armor;
- . The belief that it is too hot to wear comfortably.

"Why is it that your (force) (company) does not issue routine duty body armor?"

Forces/Companies Which  
Do Not Issue Or Plan  
To Issue Routine Duty  
Body Armor

Percentage Base:	(73)
No need for it/Our situation doesn't require routine duty body armor	66%
Our personnel not exposed to threats of violence, riots, snipers, other specific threats	15
Few or no personnel ever killed or shot (so no need)	12
Insufficient budget/Cost factors/Can't fund it	25
Nature of the armor itself	
Body armor is too heavy, cumbersome, bulky	14
Body armor is too hot	10
Body armor is uncomfortable	1
Waiting for tests/Not proven effective yet	3
All other reasons	7
Don't Know/No Response	7

AMONG AGENCIES WHICH DO NOT ISSUE OR DO NOT PLAN TO ISSUE ROUTINE DUTY BODY ARMOR, THE GREAT MAJORITY (84%) SAID THAT THEIR PERSONNEL WOULD BE FREE TO PURCHASE ROUTINE DUTY BODY ARMOR WITH THEIR OWN MONEY IF THEY WISHED TO.

"Would a member of your (force) (staff) be free to purchase routine duty body armor with his own money, if he wished?"

	Forces/Companies Which Do Not Issue Or Plan To Issue Routine Duty Body Armor
Percentage Base:	(73)
Yes	84%
No	7
Don't Know/No Response	9

THE MOST COMMON USE MENTIONED FOR ROUTINE DUTY BODY ARMOR IS FOR AUTO PATROL.

More than six in ten said they used it for this activity, both during the day, and at night.

More than five in ten said they use it for tactical squad activities.

At lower levels, the following uses were mentioned:

- . Detective work (38%);
- . Foot patrol, day (30%);
- . Foot patrol, evening (27%);
- . Motorcycle patrol (27%);
- . Desk sergeant, etc. (12%);
- . Jail/Prison guard (12%).

"For which of the following activities listed on this card would your (force) (company) ever use the routine duty body armor?"

	All Agencies	Law Enforcement Agencies			State/ County Prisons	Security Services
		State	County	Municipal		
Percentage Base: Forces/ Companies Which Issue Or Plan To Issue Routine Duty Body Armor	(34)	(2)	(4)	(21)	(4)	(3)
Auto patrol, evening	65%	50%	100%	71%	-%	67%
Auto patrol, day	62	50	100	71	-	33
Tactical squad	56	100	75	57	50	-
Detective	38	50	25	48	25	-
Foot patrol, day	30	50	25	29	25	33
Foot patrol, evening	27	50	25	24	25	33
Motorcycle patrol	27	50	25	33	-	-
Desk sergeant, etc.	12	-	-	19	-	-
Jail/Prison guard	12	50	-	5	50	-
Others	9	50	-	10	-	-
Don't Know/No Response	3	-	-	-	-	33



RESPONDENTS SAID ROUTINE DUTY BODY ARMOR IS FREQUENTLY USED ONLY IN SPECIAL SITUATIONS, RATHER THAN ON A ROUTINE BASIS.

For three applications, it tended to be used somewhat more frequently on a routine basis than on a situational basis:

- . Auto patrol, evening;
- . Auto patrol, day;
- . Motorcycle patrol.

For three applications, it was more likely to be used on a situation-by-situation basis:

- . Tactical squad;
- . Detective work;
- . Jail/Prison guard.

For three other applications, it tended to be used about equally on a routine and on a special situation basis:

- . Foot patrol, day;
- . Foot patrol, evening;
- . Desk sergeant, etc.

"Would the routine duty body armor, worn for (FROM Q.7) use, be worn on a routine basis or for special situations only?"

	Percentage Who Would Ever Use	Routine Basis	Special Situations Only
Percentage Base: 34 Forces/Companies Which Issue Or Plan To Issue Routine Duty Body Armor			
Auto patrol, evening	65%	41%	24%
Auto patrol, day	62	38	24
Tactical squad	56	12	44
Detective	38	12	29
Foot patrol, day	30	15	15
Foot patrol, evening	27	15	12
Motorcycle patrol	27	18	9
Desk sergeant, etc.	12	6	3
Jail/Prison guard	12	-	9

ONLY ABOUT ONE AGENCY IN TEN (11%) CURRENTLY USING ROUTINE DUTY BODY ARMOR SAID THEY WERE "VERY SATISFIED" WITH IT. AN ADDITIONAL FIVE IN TEN (50%) SAID THEY WERE "SOMEWHAT SATISFIED".

A total of 34% said they were dissatisfied with the routine duty body armor they currently use. Most of the dissatisfaction expressed by officials who claim that their agencies are using routine duty body armor related to the older, heavier, and bulkier types of armor.

The primary complaint voiced by the few using the new lightweight type was the question whether stopping power is adequate.

Shown following are a few representative verbatim comments as to why these agencies are satisfied or less than satisfied with their current routine duty body armor.

Supervisor Captain, San Francisco Police Department

"There is a lot of complaint about the weight, overheating and skin rash, and how it chokes them. We need it lighter and less bulky, and more comfortable as far as overheating causing rashes, etc. We've even had some officers faint from the heat in them."

Sergeant, Assistant to Chief of Police, small town, Colorado

"The weight is too much, and the cost is high. They are difficult to clean."

Warden, State Penitentiary, Illinois

"It is very heavy and outdated. It's bulky and hot."

Detective Sergeant, Metropolitan District Police, Massachusetts

"The armored protective vests we have presently in use are too heavy and too cumbersome, but they have a plus side. They have a greater bullet resistance factor than any vest I have seen up to this point."

"Overall, how satisfied would you say you are with this body armor for your (force) (company)?"

	Forces/Companies Which Now Issue Routine Duty Body Armor
Percentage Base:	(18)
Very satisfied	11%
Somewhat satisfied	50
Somewhat dissatisfied	28
Very dissatisfied	6
Don't Know/No Response	6

CHAPTER III

THE DESIRED CHARACTERISTICS AND DESIGN ELEMENTS  
OF THE "IDEAL" ROUTINE DUTY BODY ARMOR

THE SPECIFIC CHARACTERISTICS AND DESIGN ELEMENTS OF THE "IDEAL" ROUTINE DUTY BODY ARMOR ARE KEYED TO TWO MAJOR AREAS OF CONCERN -- PROTECTION AND WEARABILITY.

When asked to describe the important features necessary for their recommending purchase of routine duty body armor, these buying influentials were quite voluble and specific.

The basic concept that ties together their varied and highly articulate observations has two elements:

- . The armor provides a minimum of interference with an officer's ability to do his job;
- . The armor should do its job according to known specifications.

When, in a purchasing official's opinion, these two elements interface correctly with his organization's operational requirements, he will recommend purchase. Cost appears to be a distinctly subsidiary consideration in most cases.

The most frequently mentioned area encompassed the wearability of the armor as clothing -- with a maximum of comfort and inconspicuousness, and a minimum of interference with movement. Being light in weight and having that weight well-distributed are important characteristics.

The second most frequently mentioned area had to do with the protective qualities of the armor. Many of those who talked about protective ability mentioned the desirability of the armor's stopping the more powerful calibers such as: .357 magnum; .44; 9 MM; and rifle bullets.

Cost was infrequently mentioned as an important consideration in purchase recommendation.

The table on the following three pages shows the total array of coded responses to this open-end (free response) question.

"Thinking about the characteristics and design elements of routine duty body armor, what do you consider important features that would be necessary for you to recommend purchase of such items?"

	All Agencies
Percentage Base:	(107)
<u>Qualities As Wearable Clothing:</u>	
Lightweight/Distributed weight	54%
Wearable/Comfortable/Close to natural clothing	33
Not too bulky/Not cumbersome	14
Offer freedom of movement	13
Cool/Not too hot/Should breathe	8
Durability/Should last, wear well	9
Pliable/Not stiff/Less rigid/Flexible	8
Be easy to clean/Washable	8
Concealability/Inconspicuousness/Can't tell a man's wearing it	8
Easy to take on and off	7
Available in various sizes, individual fits	6
Available in vest form	4
Wearable in all seasons, all weather	4
Serviceability/Easily maintained	4
Available as an undergarment	2
Not hinder wearer's performance in any way	2

(Continued)

"Thinking about the characteristics and design elements of routine duty body armor, what do you consider important features that would be necessary for you to recommend purchase of such items?" (Continued)

Percentage Base:	All Agencies (107)
<u>Protection Qualities Mentioned:</u>	
Effective in general as protection (no specific mention of gunshots)	20%
Offers protection from gunshots/ Good stopping power (no specific caliber mentioned)	15
Should be able to stop --	
.357 magnum	6
.38 caliber	4
.44/45 caliber	4
rifle bullet	4
9 millimeter	3
All-around protection for the front and back, for chest area and posterior/ Trunk area	8
Protect the chest area	8
Protect the head, the head area	5
Protect vital organs	4
Protect the side area	2
Pierce resistant/Stop knives, ice picks, etc.	5
Prevent trauma, bruises	4
Fireproof/Provide protection from fire	1

(Continued)

"Thinking about the characteristics and design elements of routine duty body armor, what do you consider important features that would be necessary for you to recommend purchase of such items?" (Continued)

Percentage Base:	All Agencies (107)
<u>Cost Mentions:</u>	
Low in price/Inexpensive	8%
<u>Authentication, Official Validation:</u>	
Have approval of officials, of law enforcement authorities/Be thoroughly tested	6
<u>Others</u>	8
<u>Don't Know/No Response</u>	8

CHAPTER IV

AWARENESS OF THE PRODUCT CLASS -

ROUTINE DUTY BODY ARMOR

MADE OF WOVEN SYNTHETIC FABRIC -

PRIOR TO EXPOSURE TO KEVLAR EXHIBITS

CLAIMED AWARENESS OF THE PRODUCT CLASS - ROUTINE DUTY BODY ARMOR MADE OF WOVEN SYNTHETIC FABRIC - IS HIGH.

Eight in ten (81%) say they have seen or heard about it. Awareness is correspondingly high among law enforcement agencies, prisons, private security services, and armored car services.

"Have you seen or heard about a new type of routine duty body armor made of woven synthetic fabric?"

	<u>All Agencies</u>	<u>Law Enforcement State</u>	<u>Agencies County</u>	<u>Municipal</u>	<u>State/ County Prisons</u>	<u>Security Services</u>	<u>Armored Car Services</u>
Percentage Base:	(107)	(10)	(17)	(46)	(10)	(19)	(5)
Yes	81%	100%	88%	76%	80%	79%	80%
No	19	-	12	24	20	21	20

RESPONDENTS SAID THEY HAVE LEARNED ABOUT THIS NEW ROUTINE DUTY BODY ARMOR FROM A DIVERSITY OF SOURCES.

The most frequently recalled sources were:

- . Manufacturers' representatives (16%);
- . Law enforcement meetings and conventions (13%);
- . Stores that sell police goods (10%);
- . Police magazines (10%);
- . Conversations with fellow law enforcement officers (10%).

"Please tell me where and how you first learned about this new routine duty body armor?"

Forces/Companies Aware Of A New Type Of Routine Duty Body Armor Made Of Woven Synthetic Fabric

Percentage Base:	(87)
Manufacturers of the product/ Manufacturers' representatives	16%
Law enforcement meetings/Police officer groups/Police conventions/ Seminars	13
Store that sells police goods	10
Police magazines (general men- tion)	10
Fellow policemen's talk, rumors	10
Other specifically identified mag- azines (such as <u>Security World</u> )	9
Unspecified magazines	8
Law enforcement agencies (not in- cluding L.E.A.A.)	7
Newspapers	7
Police who have it (body armor)	6
News media (not specified)	5
Television (news, specials, etc.)	5
Catalogs or suppliers of police clothing	5
Brochures on the product	3
L.E.A.A.	2
Mail (samples, literature, advertising)	2
Bulletins from F.B.I., police, etc.	2
Others	7
Don't Know/No Response	5



RESPONDENTS' IMPRESSIONS OF THE NEW ROUTINE DUTY BODY ARMOR WERE CONSIDERABLY MORE POSITIVE THAN NEGATIVE.

The most frequent positive impressions were:

- . An overall favorable reaction (36%);
- . Its lightweight quality (20%);
- . Its ability to prevent bullet penetration (14%);
- . Its ability to save lives (10%).

No negative impression was mentioned by even one respondent in ten. The most frequent negative reactions were:

- . Concern with blunt trauma effect (7%);
- . Its making the wearer too hot (7%);
- . Its protection being limited to low caliber bullets (6%);
- . A belief that it is not comfortable enough for all-day wear (6%).

"What are your general impressions about the new body armor? PROBE: What other impressions do you have of the new routine duty body armor made of woven synthetic fabric?"

Forces/Companies Aware Of A New Type Of Routine Duty Body Armor Made Of Woven Synthetic Fabric

Percentage Base: (87)

Positive Impressions:

Fine/Good garment/Impressed/ Favorable reaction (General)	36%
Lightweight	20
Prevents bullet penetration	14
It saves lives/Prevents deaths/ Reduces number of deaths	10
It's wearable/Comfortable/Close to natural clothing	7
Able to wear under uniform	5
Effective (General)	4
Durable/Lasts a while/Wears well	3
Gives a sense of protection (Not false)	3
Flexible/Pliable/Soft	3
Not too bulky/Not too cumbersome/ Not too clumsy	2
Gives freedom of movement	2
Other positives	8

(Continued)

"What are your general impressions about the new body armor? PROBE: What other impressions do you have of the new routine duty body armor made of woven synthetic fabric?" (Continued)

Forces/Companies Aware Of A New  
Type Of Routine Duty Body Armor  
Made Of Woven Synthetic Fabric

Percentage Base:

(87)

Neutral Impressions:

No impressions/Haven't seen it  
tested

8

Negative Impressions:

Doesn't protect against blunt  
trauma. Bullets can still  
damaga body

7

Too hot

7

Only prevents low caliber  
bullets from penetrating/  
Bullets can still penetrate

6

Not comfortable enough for all  
day wear/Couldn't wear it all  
the time

6

Unimpressed/Don't like it

3

Bulky/Cumbersome/Too thick

2

Too heavy/Not lightweight

2

Other negatives

13

Don't Know/No Response

2

AWARENESS OF THE PRODUCT CLASS HAS SO FAR NOT LED TO MAJORITY PURCHASE INTEREST. MORE THAN SIX RESPONDENTS IN TEN (64%) OF THOSE AWARE OF IT SAID THEY HAVE NOT ORDERED, AND DO NOT INTEND TO ORDER THE NEW ROUTINE DUTY BODY ARMOR.

One in ten (10%) has ordered it so far, and an additional two in ten (21%) said they intend to order it.

"Do you intend to order, or have you already ordered, this new routine duty body armor?"

Forces/Companies Aware Of A New  
Type Of Routine Duty Body Armor  
Made Of Woven Synthetic Fabric

Percentage Base:	(87)
Have already ordered	10%
Intend to order	21
Do not intend to order	64
Don't Know/No Response	5

THE PRINCIPAL REASON GIVEN BY THOSE AWARE OF THE PRODUCT CLASS, BUT WHO DO NOT INTEND TO ORDER SUCH PRODUCTS, IS THAT THEY PERCEIVE NO NEED FOR THEM.

The two other principal reasons related to cost considerations and a desire to wait for further testing.

"Why is it that you don't intend to order the new body armor?"

Those Aware Of Woven  
Synthetic Fabric Routine  
Duty Body Armor Who Do  
Not Intend To Order It

Percentage Base:	(56)
No need for it	45%
Cost reasons	25
Waiting for further testing	16
Low incidence of attack	11
Need higher approval	7
Officers have allowance to buy it themselves	5
Its protection is inadequate	4
Others	11
Don't Know/No Response	4

CHAPTER V

BELIEFS CONCERNING POSSIBLE  
COUNTERPRODUCTIVE EFFECTS  
FROM THE USE OF  
ROUTINE DUTY BODY ARMOR

THERE WAS SUBSTANTIAL AGREEMENT THAT, DESPITE ITS GREAT ADVANTAGES, ROUTINE DUTY BODY ARMOR COULD WELL HAVE SOME COUNTERPRODUCTIVE EFFECTS.

The most frequent concern was the belief that criminals will also acquire body armor (67%).

The next most frequent concern was that once criminals become aware that the authorities are using body armor, they will start using more powerful weapons or shooting for the head (62%).

Moreover, 61% believed that widespread use of the armor by police and other authorities could lead to a false sense of security on their part.

As the facing table shows, there was considerable disagreement on each of these points, and the relative intensity with which these opinions are held also tends to vary.

There was minority agreement with the idea that widespread use of armor by the police could lead to a more aggressive attitude on their part (31%).

Only a small proportion (15%) believed that the new armor would create a psychological barrier between the police and the general public.

"Listed on this page are some comments which have been made about routine duty body armor. Please indicate how much you agree or disagree with each statement by circling the appropriate number opposite each statement."

	<u>Agree Completely</u>	<u>Tend To Agree</u>	<u>Tend To Disagree</u>	<u>Disagree Completely</u>
Percentage Base: (107)				
In a short time, criminals would also acquire the lightweight body armor.	30%	37	25	6
Once criminals become aware that the authorities are wearing body armor, they'll begin to use higher threat weapons or to aim for the head.	19%	43	30	8
Widespread armor usage by the authorities could lead to a false sense of security on their part.	15%	46	30	9
Widespread police armor usage could lead to a more aggressive attitude on the part of the police.	9%	22	48	21
Widespread armor usage would create a psychological barrier between the police and the general public.	4%	11	39	45

CHAPTER VI

REACTION TO THE KEVLAR CONCEPT STATEMENT  
AND EXHIBIT MATERIALS

REACTION TO KEVLAR AND ITS CHARACTERISTICS WAS VERY POSITIVE. BETTER THAN EIGHT RESPONDENTS IN TEN RATED IT AN EXCELLENT (27%) OR A GOOD (56%) PRODUCT.

Only one in ten (10%) rated Kevlar a fair product, and 1% rated it a poor product.

These reactions were obtained after respondents had been asked to read a factual description of Kevlar and its characteristics, were shown pictures of the material made up into various uniform and civilian garments, and allowed to examine a 12" by 12" swatch of the material itself. (See Appendix for exhibit materials).

The factual description respondents read was the following:

"This new body armor is both lightweight and durable. It is made of seven layers of a woven material called Kevlar. It will not be penetrated by .38 or smaller caliber bullets, even fired at close range. These calibers account for 95% of the handguns confiscated by law enforcement agencies. If there were any injury to the wearer from a bullet fired at close range, it would result from blunt trauma effect. Additionally, the material is highly resistant to penetration by a knife or razor.

Prototype garments (undershirts, sports jackets, and uniform components) have been produced and successfully tested for wearability. These garments are less than half the weight of commercially available nylon protective garments, and can be worn for routine patrol operations during most of the year. There is no hindrance in movement when wearing such items. Cleaning can be performed on the items, using a light grade laundry soap.

The estimated average life of garments made of the material is two to three years."

"Everything considered, what is your overall impression of the product?"

	All Agencies
Percentage Base:	(107)
An excellent product	27%
A good product	56
A fair product	10
A poor product	1
Don't Know/No Response	6



VIRTUALLY ALL RESPONDENTS (94%) LIKED SOMETHING ABOUT THE KEVLAR PRODUCT. NO ONE (0%) SAID THERE WAS NOTHING ABOUT THE PRODUCT THAT THEY LIKED.

There was substantial spontaneous positive response to Kevlar. Many of the specific positive aspects mentioned by respondents parallel those which they had earlier described as being important in their recommending purchase of a routine duty body armor product.

The most frequently mentioned product characteristic was lightness. Six in ten (62%) were favorably impressed with the lightness of the Kevlar product.

Other positive reactions, mentioned by between one and two in ten, were:

- . Its pliability/Flexibility (17%);
- . Its apparent wearability and probable comfort (17%);
- . Its good stopping power (17%);
- . Its lack of bulk (16%);
- . Its probable inconspicuousness (15%);
- . Its washability (11%);
- . Its lack of hindrance of movement (10%).

"As far as you are concerned, what, if anything, do you like about the product?"

	All Agencies
Percentage Base:	(107)
<u>Something Liked About The Product</u>	<u>94%</u>
It's lightweight	62%
It's pliable/Not stiff/Less rigid/Soft	17
It's wearable/Comfortable/Close to natural clothing	17
Offers good protection from gunshots/Good stopping power	17
It's not too bulky/Not cumbersome/Thin	16
Can't tell someone is wearing it/It's not obvious/Concealability	15
Easy to clean/Washable	11
Offers freedom of movement	10
Available in various clothing styles	8
Durable/Will last a while	8
Available as undershirt/Can wear it underneath uniform	7
Cool/Not too hot	6
Resistance to knives	6
Available as sportcoat	4
Good body coverage/Offers protection of vital organs	3
Adaptable to everyday wear/Can be made a part of the uniform	3
Can be worn at all times	3
Appearance/Looks good/Neat looking	3
Won't chafe the skin/Cause skin rash	2
All other positive responses	22
<u>Nothing Liked About The Product</u>	<u>0%</u>
Don't Know/No Response	6

Q.17 "As far as you are concerned, what, if anything, do you like about the product?  
 PROBE: What else do you like about it? PROBE: What else?"

	Law Enforcement Agencies			State/ County Prisons	Security Services	Armored Car Services
	State	County	Municipal			
Percentage Base:	(10)	(17)	(46)	(10)	(19)	(5)
It's lightweight	70%	53%	65%	50%	68%	40%
It's wearable/Comfortable/Close to natural clothing	20	18	17	10	21	-
Offers good protection from gun-shots/Good stopping power	20	18	17	10	16	20
Can't tell someone is wearing it/It's not obvious/Concealability	20	12	17	10	16	-
Offers freedom of movement	20	6	7	30	5	20
Easy to clean/Washable	20	-	17	10	5	-
Resistance to knives	20	-	2	20	5	-
It's not too bulky/Not cumbersome/Thin	10	24	11	20	26	-
It's pliable/Not stiff/Less rigid/Soft	10	12	17	20	21	20
Available in various clothing styles	10	12	9	-	5	-
Available as undershirt/Underneath uniform	10	-	4	10	11	20
Cool/Not too hot	-	18	4	-	5	-
Durable/Last a while	-	6	4	20	16	-
Good body coverage/Offers protection of vital organs	-	6	4	-	-	-
Adaptable to everyday wear/Can be made a part of the uniform	-	6	4	-	-	-
Available as sportcoat	-	6	2	20	-	-
Can be worn at all times/Extended period of time	-	6	2	10	-	-
Appearance/Looks good/Neat looking	-	-	4	-	5	-

(Continued)  
 \*\* 54 \*\*

Q.17 "As far as you are concerned, what, if anything, do you like about the product?  
 PROBE: What else do you like about it? PROBE: What else?" (Continued)

	Law Enforcement Agencies			State/ County Prisons	Security Services	Armored Car Services
	State	County	Municipal			
Percentage Base:	(10)	(17)	(46)	(10)	(19)	(5)
Won't chafe the skin/Cause skin rash	-%	-%	4%	-%	-%	-%
All other responses	20	24	20	20	21	40
No Response/Can't answer without seeing	10	6	7	10	-	-

NEGATIVE REACTIONS TO KEVLAR WERE CONSIDERABLY LESS FREQUENT THAN POSITIVE REACTIONS. TWO RESPONDENTS IN TEN (21%) FOUND NOTHING THEY DISLIKED ABOUT THE PRODUCT.

Seven in ten (74%) disliked something about the Kevlar product. The most frequent criticism of Kevlar related to the idea that Kevlar garments would be too warm (24%).

The only other negative reaction to the product mentioned by more than one in ten was the idea that the product offered protection only from smaller caliber handguns (14%).

Two in ten (21%) found nothing that they disliked about the product.

"On the other hand, what, if anything, do you dislike about the product?"

	All Agencies
Percentage Base:	(107)
<u>Something Disliked About The Product</u>	<u>74%</u>
Any mention of being too warm (NET)	24%
Too hot/Too hot under a shirt	8
Not practical in summer/Warm weather	9
Doesn't seem to breathe/Let air in	9
Only protects from small hand guns/No protection from high caliber bullets	14
Life span of body armor only 2 or 3 years	6
Bulky/Cumbersome/Too thick	5
It's not wearable/Uncomfortable	5
Not protected from blunt trauma	4
Too heavy/Not lightweight	4
Stiff/Rigid/Not flexible/Not pliable	4
Limited protection of body surface	3
Unsure it would be very effective	3
Product is not adequately tested/proven	3
Might be abrasive to skin/Feels coarse	2
Don't like the metal buckles	2
The cost is too high/Very high	2
Won't hold heat of the body/Won't keep body warm	1
Other negative responses	14
<u>Nothing Disliked About The Product</u>	<u>21%</u>
Don't Know/No Response	6

CHAPTER VII

ACTIVITIES FOR WHICH  
KEVLAR PRODUCTS WOULD BE USED

The table opposite shows the complete breakdown of the activities for which the various agencies would use Kevlar products.

"If this body armor were available for any of the activities listed on this card, for which of them do you think your (force) (company) would ever use it?"

	All Agencies	Law Enforcement Agencies State	County	Municipal	State/ County Prisons	Security Services	Armored Car Services
Percentage Base:	(107)	(10)	(17)	(46)	(10)	(19)	(5)
Auto patrol, evening	71%	70%	100%	87%	10%	47%	40%
Auto patrol, day	52	50	82	67	10	21	20
Detective	44	30	47	57	20	42	-
Tactical squad	44	50	59	50	50	21	-
Foot patrol, evening	32	10	24	33	20	63	-
Foot patrol, day	24	10	18	28	30	32	-
Motorcycle patrol	21	40	24	26	10	5	-
Jail/Prison guard	15	-	35	4	70	5	-
Desk sergeant, etc.	9	10	-	11	-	16	20
Guards (other)	3	-	-	-	-	11	20
K-9 Corps	2	10	6	-	-	-	-
Others	8	10	6	4	30	5	20
Don't Know/No Response/None	6	10	-	2	-	16	20

FOR MOST OF THE ACTIVITIES FOR WHICH THESE AGENCIES VISUALIZE USING KEVLAR GARMENTS, THEY ARE MORE LIKELY TO USE THEM ON A ROUTINE BASIS THAN ONLY FOR SPECIAL SITUATIONS.

The situations for which there was a relatively strong intention to use the Kevlar garments routinely were:

- . Auto patrol, evening;
- . Auto patrol, day;
- . Foot patrol, day;
- . Motorcycle patrol.

Applications for which Kevlar garments were visualized on more of a special situation basis were:

- . Tactical squad;
- . Jail/Prison guard duty.

The situations for which Kevlar was about equally likely to be used either routinely or on a special situation basis were:

- . Detective work;
- . Foot patrol, evening.

"When used for (FROM Q.21) duty, do you think this body armor would be worn on a routine basis, or only for special situations?"

	All Agencies	Law Enforcement State	Agencies County	Municipal	State/ County Prisons	Security Services	Armored Car Services
Percentage Base:	(107)	(10)	(17)	(46)	(10)	(19)	(5)
<u>Auto Patrol, Evening</u>							
Routine basis	51%	50%	77%	67%	-%	26%	20%
Special basis	20	20	24	20	10	26	20
<u>Auto Patrol, Day</u>							
Routine basis	40%	40%	65%	54%	-%	16%	-%
Special basis	12	10	18	13	10	5	20
<u>Detective</u>							
Routine basis	22%	30%	18%	30%	10%	16%	-%
Special basis	22	-	29	26	10	26	-
<u>Tactical Squad</u>							
Routine basis	17%	20%	35%	22%	-%	-%	-%
Special basis	27	30	24	28	50	21	-
<u>Foot Patrol, Evening</u>							
Routine basis	18%	10%	18%	24%	-%	26%	-%
Special basis	14	-	6	9	20	42	-
<u>Foot Patrol, Day</u>							
Routine basis	16%	10%	12%	22%	10%	16%	-%
Special basis	8	-	6	7	20	16	-

(Continued)

"When used (FROM Q.21) duty, do you think this body armor would be worn on a routine basis, or only for special situations?" (Continued)

	All Agencies	Law State	Enforcement County	Agencies Municipal	State/ County Prisons	Security Services	Armored Car Services
Percentage Base:	(107)	(10)	(17)	(46)	(10)	(19)	(5)
<u>Motorcycle Patrol</u>							
Routine basis	16%	30%	24%	22%	-%	-%	-%
Special basis	5	10	-	4	10	5	-
<u>Jail/Prison Guard</u>							
Routine basis	6%	-%	18%	2%	20%	-%	-%
Special basis	9	-	18	2	50	5	-
<u>Desk Sergeant, Etc.</u>							
Routine basis	6%	-%	-%	7%	-%	16%	20%
Special basis	3	10	-	4	-	-	-
<u>Guards (Other)</u>							
Routine basis	3%	-%	-%	-%	-%	11%	20%
Special basis	-	-	-	-	-	-	-
<u>K-9 Corps</u>							
Routine basis	2%	10%	6%	-%	-%	-%	-%
Special basis	-	-	-	-	-	-	-
<u>Others</u>							
Routine basis	6%	10%	6%	4%	20%	5%	-%
Special basis	2	-	-	-	20	-	20
Don't Know/No Response/None	6%	10%	-%	2%	-%	16%	20%

CHAPTER VIII

PROJECTED POTENTIAL MARKET FOR KEVLAR GARMENTS



THERE WAS PURCHASE INTEREST IN VIRTUALLY EVERY ONE OF THE NINE KEVLAR GARMENTS FOR WHICH PHOTOGRAPH EXHIBITS WERE SHOWN TO RESPONDENTS.

Every respondent was shown photographs of policemen wearing each of the nine Kevlar garments and a price list showing the estimated cost for each of the items. He was then asked a series of three questions:

- . "Here are some pictures of routine duty body armor garments made from the new material, and this card shows how much each garment is likely to cost. Which, if any, of the nine garments shown in these pictures do you think your (force) (company) would be likely to purchase over the next several years?"
- . (FOR EACH ITEM MENTIONED ABOVE) "As best you can estimate, how many units of the \_\_\_\_\_ do you think your (force) (company) would be likely to purchase in your fiscal 1977, the first year it will be available?"
- . (FOR EACH ITEM MENTIONED ABOVE) "Assuming the garments perform well, how many units of the \_\_\_\_\_ do you think your (force) (company) will order, on the average, each year after that?"

As shown on the table opposite, 42% of all agencies said they would be likely to buy some of the undershirt garments during the next several years.

In order, the next most frequently named items were:

- . The dress vest;
- . The vinyl patrol jacket;
- . The sport coat;
- . The cloth jacket;
- . The trooper coat;
- . The motorcycle jacket;
- . The officer's coat;
- . The scooter coat.

CONTINUED

1 OF 2

THERE WAS PURCHASE INTEREST IN VIRTUALLY EVERY ONE OF THE NINE KEVLAR GARMENTS FOR WHICH PHOTOGRAPH EXHIBITS WERE SHOWN TO RESPONDENTS.

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- "Here are some pictures of routine duty body armor garments made from the new material, and this card shows how much each garment is likely to cost. Which, if any, of the nine garments shown in these pictures do you think your (force) (company) would be likely to purchase over the next several years?"

- (FOR EACH ITEM MENTIONED ABOVE) "As best you can estimate, how many units of the \_\_\_\_\_ do you think your (force) (company) would be likely to purchase in your fiscal 1977, the first year it will be available?"

- (FOR EACH ITEM MENTIONED ABOVE) "Assuming the garments perform well, how many units of the \_\_\_\_\_ do you think your (force) (company) will order, on the average, each year after that?"

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In order, the next most frequently named items were:

- The dress vest;
- The vinyl patrol jacket;
- The sport coat;
- The cloth jacket;
- The trooper coat;
- The motorcycle jacket;
- The officer's coat;
- The scooter coat.

"Here are some pictures of routine duty body armor garments made from the new material, and this card shows how much each garment is likely to cost. Which, if any, of the nine garments in these pictures do you think your (force) (company) would be likely to purchase over the next several years?"

	All Agencies	Law State	Enforcement County	Agencies Municipal	State/ County Prisons	Security Services	Armored Car Services
Percentage Base: All Such U.S. Forces/Companies (Weighted Bases)	(23,199)	(200)	(3,383)	(14,444)	(3,630)	(1,197)	(345)
Undershirt	42%	50%	53%	41%	40%	32%	-%
Dress Vest	23	10	24	24	20	21	20
Vinyl Patrol Jacket	15	-	-	20	10	11	20
Sport Coat	9	10	12	7	20	-	-
Cloth Jacket	6	10	-	4	10	21	20
Trooper Coat	6	-	12	4	10	-	-
Motorcycle Jacket	5	10	6	7	-	-	-
Officer's Coat	2	-	-	2	-	5	-
Scooter Coat	*	-	-	-	-	5	-
None	22	30	24	20	30	26	20
Don't Know	9	-	12	9	10	-	40

\*Less than 0.5 percent.

AMONG THOSE RESPONDENTS WITH NO STATED PURCHASE INTEREST IN ANY KEVLAR GARMENT, THE MOST FREQUENT REASON GIVEN FOR NOT BEING INTERESTED IN BUYING THE PRODUCTS IS THE BELIEF THAT THEY ARE TOO EXPENSIVE (35%).

Between two and three in ten (26%) said there is no need for it in their agency. Almost two in ten (18%) have no budgeted funds to buy the garments.

About one in ten said they are not interested because:

- . The products are not proven yet (9%);
- . Their officers have an allowance which would permit them to purchase their own (9%).

REASONS FOR LACK OF, OR UNCERTAINTY ABOUT, PURCHASE INTEREST IN KEVLAR GARMENTS

	All Agencies	Law State	Enforcement County	Agencies Municipal	State/ County Prisons	Security Services	Armored Car Services
Percentage Base:	(34)	(3)	(6)	(13)	(4)	(5)	(3)
Too expensive/More expensive than others	35%	-%	50%	54%	-%	40%	-%
No need for it/Low incidence of attacks	26	100	-	-	50	80	-
Not in budget	18	-	33	23	-	20	-
Not proven yet	9	33	17	-	25	-	-
Officers have allowance/ Could purchase their own	9	-	-	23	-	-	-
Protection is inadequate	6	33	17	-	-	-	-
Higher approval necessary	3	-	-	-	-	-	33
Others	18	-	-	31	25	-	33
Don't Know/No Response	6	-	-	8	-	-	33

PROJECTING THE DATA FROM THE SAMPLE TO ALL SUCH AGENCIES NATIONWIDE REVEALS A TREMENDOUS FIRST YEAR SALES POTENTIAL FOR KEVLAR GARMENTS -- ON THE ORDER OF \$280,000,000 FOR ALL NINE GARMENTS.

As the table opposite shows, the dress vest, the undershirt, and the cloth jacket each indicate a sales potential of approximately \$70,000,000 the first year they are available, given the current estimated price per unit. These three garments alone would account for approximately three-quarters of first year total potential sales.

Vinyl patrol jackets are projected to yield a sales potential of approximately \$27,000,000 the first year.

The potential for trooper coats and sports coats is projected to be approximately \$13,000,000 for each garment the first year.

Projected first year sales potential for motorcycle jackets is about \$4,500,000.

Interest in the officer's coat and scooter coat was quite limited, and projected sales for these garments are on the order of \$100,000 each, the first year.

The tables on the following pages show the complete detail of projected potential sales for each of the nine garments. These projections are based on the total number of similar agencies throughout the United States, and represent total potential sales volume. Because of the small size of the sample for this study, these projections must of necessity be viewed as relatively gross approximations.

PROJECTED APPROXIMATE FIRST YEAR SALES - ALL KEVLAR GARMENTS

<u>Garment</u>	<u># Of Units</u>	<u>Cost Per Unit</u>	<u>Total \$ Sales</u>
Dress Vests	361,439	\$210	\$ 75,902,190
Undershirts	357,986	\$210	75,177,060
Cloth Jacket	216,664	\$325	70,415,800
Vinyl Patrol Jacket	83,449	\$325	27,120,925
Trooper Coat	41,044	\$325	13,339,300
Sport Coat	32,488	\$420	13,644,960
Motorcycle Jacket	13,798	\$325	4,484,350
Officer's Coat	440	\$325	143,000
Scooter Coat	315	\$325	102,375
			<u>\$280,329,960</u>

"As best you can estimate, how many units of the dress vests do you think your (force) (company) would be likely to purchase in your fiscal 1977, the first year it will be available?"

	All Agencies	Law Enforcement Agencies			State/ County Prisons	Security Services	Armored Car Services
		State	County	Municipal			
Percentage Base: All Such U.S. Forces/Companies (Weighted Bases)	(23,199)	(200)	(3,383)	(14,444)	(3,630)	(1,197)	(345)
Not likely to purchase at all	77%	90%	77%	76%	80%	79%	80%
Likely to purchase, and units specified for 1977	20%	10%	24%	22%	10%	16%	20%
Projected number of units purchased in 1977	361,439	6,000	113,231	236,442	3,630	756	1,380
Percentage of units likely to be purchased	100%	1.7%	31.3%	55.4%	1.0%	.2%	.4%

PARTIAL TABLE: Conditional responses not shown.

"As best you can estimate, how many units of the undershirts do you think your (force) (company) would be likely to purchase in your fiscal 1977, the first year it will be available?"

	All Agencies	Law Enforcement Agencies			State/ County Prisons	Security Services	Armored Car Services
		State	County	Municipal			
Percentage Base: All Such U.S. Forces/Companies (Weighted Bases)	(23,199)	(200)	(3,383)	(14,444)	(3,630)	(1,197)	(345)
Not likely to purchase at all	58%	50%	47%	59%	60%	68%	100%
Likely to purchase, and units specified for 1977	33%	40%	53%	30%	30%	21%	-%
Projected number of units purchased in 1977	357,986	25,540	189,647	104,876	29,040	8,883	-
Percentage of units likely to be purchased	100%	7.1%	53.0%	29.3%	8.1%	2.5%	-%

PARTIAL TABLE: Conditional responses not shown.

"As best you can estimate, how many units of the cloth jackets do you think your (force) (company) would be likely to purchase in your fiscal 1977, the first year it will be available?"

	All Agencies	Law State	Enforcement County	Agencies Municipal	State/ County Prisons	Security Services	Armored Car Services
Percentage Base: All Such U.S. Forces/Companies (Weighted Bases)	(23,199)	(200)	(3,383)	(14,444)	(3,630)	(1,197)	(345)
Not likely to purchase at all	94%	90%	100%	96%	90%	79%	80%
Likely to purchase, and units specified for 1977	6%	10%	-%	4%	10%	16%	20%
Projected number of units purchased in 1977	216,664	100,000	-	64,056	36,300	14,238	2,070
Percentage of units likely to be purchased	100%	46.2%	-%	29.6%	16.8%	6.6%	1.0%

PARTIAL TABLE: Conditional responses not shown.

"As best you can estimate, how many units of the vinyl patrol jackets do you think your (force) (company) would be likely to purchase in your fiscal 1977, the first year it will be available?"

	All Agencies	Law State	Enforcement County	Agencies Municipal	State/ County Prisons	Security Services	Armored Car Services
Percentage Base: All Such U.S. Forces/Companies (Weighted Bases)	(23,199)	(200)	(3,383)	(14,444)	(3,630)	(1,197)	(345)
Not likely to purchase at all	85%	100%	100%	80%	90%	90%	80%
Likely to purchase, and units specified for 1977	13%	-%	-%	17%	10%	11%	20%
Projected number of units purchased in 1977	83,449	-	-	68,452	8,901	5,544	552
Percentage of units likely to be purchased	100%	-%	-%	82.2%	10.7%	6.7%	.7%

PARTIAL TABLE: Conditional responses not shown.

"As best you can estimate, how many units of the trooper coats do you think your (force) (company) would be likely to purchase in your fiscal 1977, the first year it will be available?"

	All Agencies	Law Enforcement Agencies			State/ County Prisons	Security Services	Armored Car Services
		State	County	Municipal			
Percentage Base: All Such U.S. Forces/Companies (Weighted Bases)	(23,199)	(200)	(3,383)	(14,444)	(3,630)	(1,197)	(345)
Not likely to purchase at all	94%	100%	88%	96%	90%	100%	100%
Likely to purchase, and units specified for 1977	5%	-%	12%	2%	10%	-%	-%
Projected number of units purchased in 1977	41,044	-	6,368	26,690	7,986	-	-
Percentage of units likely to be purchased	100%	-%	15.5%	65.0%	19.5%	-%	-%

PARTIAL TABLE: Conditional responses not shown.

"As best you can estimate, how many units of the sport coats do you think your (force) (company) would be likely to purchase in your fiscal 1977, the first year it will be available?"

	All Agencies	Law Enforcement Agencies			State/ County Prisons	Security Services	Armored Car Services
		State	County	Municipal			
Percentage Base: All Such U.S. Forces/Companies (Weighted Bases)	(23,199)	(200)	(3,383)	(14,444)	(3,630)	(1,197)	(345)
Not likely to purchase at all	91%	90%	88%	94%	80%	100%	100%
Likely to purchase, and units specified for 1977	7%	10%	12%	7%	10%	-%	-%
Projected number of units purchased in 1977	32,488	500	14,925	11,618	5,445	-	-
Percentage of units likely to be purchased	100%	1.5%	45.9%	35.8%	16.8%	-%	-%

PARTIAL TABLE: Conditional responses not shown.

"As best you can estimate, how many units of the motorcycle jackets do you think your (force) (company) would be likely to purchase in your fiscal 1977, the first year it will be available?"

	All Agencies	Law Enforcement Agencies			State/ County Prisons	Security Services	Armored Car Services
		State	County	Municipal			
Percentage Base: All Such U.S. Forces/Companies (Weighted Bases)	(23,199)	(200)	(3,383)	(14,444)	(3,630)	(1,197)	(345)
Not likely to purchase at all	95%	90%	94%	94%	100%	100%	100%
Likely to purchase, and units specified for 1977	5%	10%	6%	7%	-%	-%	-%
Projected number of units purchased in 1977	13,798	500	7,960	5,338	-	-	-
Percentage of units likely to be purchased	100%	3.6%	57.7%	38.7%	-%	-%	-%

"As best you can estimate, how many units of the officer's coats do you think your (force) (company) would be likely to purchase in your fiscal 1977, the first year it will be available?"

	All Agencies	Law Enforcement Agencies			State/ County Prisons	Security Services	Armored Car Services
		State	County	Municipal			
Percentage Base: All Such U.S. Forces/Companies (Weighted Bases)	(23,199)	(200)	(3,383)	(14,444)	(3,630)	(1,197)	(345)
Not likely to purchase at all	98%	100%	100%	98%	100%	95%	100%
Likely to purchase, and units specified for 1977	2%	-%	-%	2%	-%	5%	-%
Projected number of units purchase in 1977	440	-	-	314	-	126	-
Percentage of units likely to be purchased	100%	-%	-%	71.4%	-%	28.6%	-%



"As best you can estimate, how many units of the scooter coats do you think your (force) (company) would be likely to purchase in your fiscal 1977, the first year it will be available?"

	<u>All Agencies</u>	<u>Law Enforcement State</u>	<u>Agencies County</u>	<u>Municipal</u>	<u>State/ County Prisons</u>	<u>Security Services</u>	<u>Armored Car Services</u>
Percentage Base: All Such U.S. Forces/Companies (Weighted Bases)	(23,199)	(200)	(3,383)	(14,444)	(3,630)	(1,197)	(345)
Not likely to purchase at all	100%	100%	100%	100%	100%	95%	100%
Likely to purchase, and units specified for 1977	*%	-%	-%	-%	-%	5%	-%
Projected number of units purchased in 1977	315	-	-	-	-	315	-
Percentage of units likely to be purchased	100%	-%	-%	-%	-%	100%	-%

\*Less than 0.5 percent.

PROJECTED ANNUAL REPLACEMENT SALES POTENTIAL FOR THE KEVLAR GARMENTS IS ALSO SUBSTANTIAL -- APPROXIMATELY \$100,000,000 PER YEAR FOR ALL GARMENTS.

The table opposite shows the approximate number of potential sales projected for each garment for each year past 1977.

The most popular garment for continuous repeat sales is the cloth jacket, representing a projected potential annual sales level of about \$50,000,000.

At considerably lower levels were:

- . The dress vest, representing a potential of \$18,000,000 per year;
- . The undershirt, with a potential of approximately \$12,000,000 annually;
- . The sport coat, with approximately \$14,000,000 annual sales potential.

At considerably lower levels were the vinyl patrol jacket, with approximately \$6,500,000 in annual sales potential, and the trooper coat, at the \$4,000,000 level.

Annual replacement sales for the motorcycle jacket and the officer's coat were considerably lower, at the \$400,000 and \$150,000 level, respectively.

The table shows no replacement sales potential for scooter coats, since none of the respondents indicated they would purchase it after 1977.

The following eight pages detail projected annual potential sales levels for each of the eight garments shown opposite.

PROJECTED APPROXIMATE ANNUAL REPLACEMENT SALES - ALL KEVLAR GARMENTS

<u>Garment</u>	<u># Of Units</u>	<u>Cost Per Unit</u>	<u>Total \$ Sales</u>
Cloth Jacket	153,830	\$325	\$ 49,994,750
Dress Vest	87,990	\$210	18,477,900
Undershirt	56,083	\$210	11,777,430
Sport Coat	32,491	\$420	13,646,220
Vinyl Patrol Jacket	20,213	\$325	6,569,225
Trooper Coat	13,013	\$325	4,229,225
Motorcycle Jacket	1,356	\$325	440,700
Officer's Coat	440	\$325	143,000
			<u>\$105,278,450</u>

"Assuming the garments perform well, how many units of the cloth jackets do you think your (force) (company) will order, on the average, each year after that?"

	All Agencies	Law Enforcement Agencies			State/ County Prisons	Security Services	Armored Car Services
		State	County	Municipal			
Percentage Base: All Such U.S. Forces/Companies (Weighted Bases)	(23,199)	(200)	(3,383)	(14,444)	(3,630)	(1,197)	(345)
Not likely to purchase at all	94%	90%	100%	96%	90%	79%	80%
Would make average purchase each year after 1977	5%	-%	-%	4%	10%	11%	20%
Number of units represented by average purchases each year after 1977	153,830	-	-	141,614	9,075	1,071	2,070
Percentage of units likely to be purchased	100%	-%	-%	92%	5.9%	.7%	1.3%

PARTIAL TABLE: Conditional responses not shown.

"Assuming the garments perform well, how many units of the dress vests do you think your (force) (company) will order, on the average, each year after that?"

	All Agencies	Law Enforcement Agencies			State/ County Prisons	Security Services	Armored Car Services
		State	County	Municipal			
Percentage Base: All Such U.S. Forces/Companies (Weighted Bases)	(23,199)	(200)	(3,383)	(14,444)	(3,630)	(1,197)	(345)
Not likely to purchase at all	77%	90%	77%	76%	80%	79%	80%
Would make average purchase each year after 1977	13%	10%	12%	15%	10%	5%	20%
Number of units represented by average purchases each year after 1977	87,990	1,000	20,298	61,544	4,356	378	414
Percentage of units likely to be purchased	100%	1.1%	23.1%	69.9%	5.0%	.4%	.5%

PARTIAL TABLE: Conditional responses not shown.

"Assuming the garments perform well, how many units of the undershirts do you think your (force) (company) will order, on the average, each year after that?"

	All Agencies	Law Enforcement Agencies			State/ County Prisons	Security Services	Armored Car Services
		State	County	Municipal			
Percentage Base: All Such U.S. Forces/Companies (Weighted Bases)	(23,199)	(200)	(3,383)	(14,444)	(3,630)	(1,197)	(345)
Not likely to purchase at all	58%	50%	47%	59%	60%	68%	100%
Would make average purchase each year after 1977	18%	20%	12%	20%	20%	16%	-%
Number of units represented by average purchases each year after 1977	56,083	3,980	20,298	20,096	10,890	819	-
Percentage of units likely to be purchased	100%	7.1%	36.2%	35.8%	19.4%	1.5%	-%

PARTIAL TABLE: Conditional responses not shown.

"Assuming the garments perform well, how many units of the sport coats do you think your (force) (company) will order, on the average, each year after that?"

	All Agencies	Law Enforcement Agencies			State/ County Prisons	Security Services	Armored Car Services
		State	County	Municipal			
Percentage Base: All Such U.S. Forces/Companies (Weighted Bases)	(23,199)	(200)	(3,383)	(14,444)	(3,630)	(1,197)	(345)
Not likely to purchase at all	91%	90%	88%	94%	80%	100%	100%
Would make average purchase each year after 1977	4%	10%	-%	4%	10%	-%	-%
Number of units represented by average purchases each year after 1977	32,491	100	-	32,028	363	-	-
Percentage of units likely to be purchased	100%	.3%	-%	98.6%	1.1%	-%	-%

PARTIAL TABLE: Conditional responses not shown.

"Assuming the garments perform well, how many units of the vinyl patrol jackets do you think your (force) (company) will order, on the average, each year after that?"

	All Agencies	Law Enforcement Agencies			State/ County Prisons	Security Services	Armored Car Services
		State	County	Municipal			
Percentage Base: All Such U.S. Forces/Companies (Weighted Bases)	(23,199)	(200)	(3,383)	(14,444)	(3,630)	(1,197)	(345)
Not likely to purchase at all	85%	100%	100%	80%	90%	90%	80%
Would make average purchase each year after 1977	13%	-%	-%	17%	10%	11%	20%
Number of units represented by average purchases each year after 1977	20,213	-	-	11,618	6,171	2,079	345
Percentage of units likely to be purchased	100%	-%	-%	57.5%	30.5%	10.3%	1.7%

PARTIAL TABLE: Conditional responses not shown.

"Assuming the garments perform well, how many units of the trooper coats do you think your (force) (company) will order, on the average, each year after that?"

	All Agencies	Law Enforcement Agencies			State/ County Prisons	Security Services	Armored Car Services
		State	County	Municipal			
Percentage Base: All Such U.S. Forces/Companies (Weighted Bases)	(23,199)	(200)	(3,383)	(14,444)	(3,630)	(1,197)	(345)
Not likely to purchase at all	94%	100%	88%	96%	90%	100%	100%
Would make average purchase each year after 1977	4%	-%	6%	2%	10%	-%	-%
Number of units represented by average purchases each year after 1977	13,013	-	199	6,280	6,534	-	-
Percentage of units likely to be purchased	100%	-%	1.5%	48.3%	50.2%	-%	-%

PARTIAL TABLE: Conditional responses not shown.

"Assuming the garments perform well, how many units of the motorcycle jackets do you think your (force) (company) will order, on the average, each year after that?"

	All Agencies	Law Enforcement Agencies			State/ County Prisons	Security Services	Armored Car Services
		State	County	Municipal			
Percentage Base: All Such U.S. Forces/Companies (Weighted Bases)	(23,199)	(200)	(3,383)	(14,444)	(3,630)	(1,197)	(345)
Not likely to purchase at all	95%	90%	94%	94%	100%	100%	100%
Would make average purchase each year after 1977	4%	10%	-%	7%	-%	-%	-%
Number of units represented by average purchases each year after 1977	1,356	100	-	1,256	-	-	-
Percentage of units likely to be purchased	100%	7.4%	-%	92.6%	-%	-%	-%

PARTIAL TABLE: Conditional responses not shown.

"Assuming the garments perform well, how many units of the officer's coats do you think your (force) (company) will order, on the average, each year after that?"

	All Agencies	Law Enforcement Agencies			State/ County Prisons	Security Services	Armored Car Services
		State	County	Municipal			
Percentage Base: All Such U.S. Forces/Companies (Weighted Bases)	(23,199)	(200)	(3,383)	(14,444)	(3,630)	(1,197)	(345)
Not likely to purchase at all	98%	100%	100%	98%	100%	95%	100%
Would make average purchase each year after 1977	2%	-%	-%	2%	-%	5%	-%
Number of units represented by average purchases each year after 1977	440	-	-	314	-	126	-
Percentage of units likely to be purchased	100%	-%	-%	71.4%	-%	28.6%	-%

APPENDIX

SOURCES FOR SALES PROJECTIONS --

TOTAL NUMBERS OF U.S. AGENCIES WITHIN EACH CATEGORY

<u>Type Of Agency</u>	<u>Source</u>
State Law Enforcement Agencies	<u>Criminal Justice Agencies In The United States Summary Report - 1970</u>  U.S. Department of Justice Law Enforcement Assistance Administration National Institute Of Law Enforcement And Criminal Justice Statistics Division Publication #SD - D - 1 L.C. Card #79-610902
County Law Enforcement Agencies	<u>FBI Unified Crime Report - 1975</u>
Municipal Law Enforcement Agencies	<u>FBI Unified Crime Report - 1975</u>
Private Armored Car Services	<u>The Private Police Industry: Its Nature &amp; Extent</u>  Vol. II - R-870/DOJ By James S. Kakalik & Sorrell Wildhorn (Study Director) Of The Rand Corporation National Institute Of Law Enforcement And Criminal Justice U.S. Dept. Of Justice - LEAA February 1972 - PR - 72 - J
Private Security Services	<u>Neil Holmes Of Allied Security - Pittsburg, Penn.</u>
State Or County Prisons - Adult	<u>FBI Unified Crime Report - 1975</u>



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July, 1975

Resp. no. cols. 1 thru 5-  
Cols. 6 thru 10- 95016  
Col. 11-1

BODY ARMOR QUESTIONNAIRE

Hello, I'm \_\_\_\_\_ with Tyler Research Associates, Inc., a national public opinion and marketing research firm. We're conducting a survey for the Law Enforcement Assistance Administration of the U.S. Department of Justice, and would appreciate a few minutes of your time.

1. As far as you know, in the past 5 years have assaults on police and other security officers in your (city), (county), (state): (READ CATEGORIES)

- Increased a great deal 12-1
- Increased slightly -2
- Stayed the same -3
- Decreased slightly -4
- Decreased a great deal -5
- Don't Know (DO NOT READ) -6

(HAND RESPONDENT CARD "1")

2. On this card are different types of ballistic protective items. Which, if any, does your (force) (company) now issue? (RECORD BELOW UNDER Q.2 "NOW ISSUE").
3. What others, if any, are you planning to issue in the near future? (RECORD BELOW UNDER Q.3 "PLANNING TO ISSUE").

	Q.2 NOW ISSUE	Q.3 PLANNING TO ISSUE
Hand-held ballistic shields	13-1	14-1
Patrol car armor	-2	-2
Ballistic helmets	-3	-3
Special armored cars	-4	-4
Routine duty body armor	-5	-5
Flak jackets and other special situation body armor	-6	-6
Other _____ (SPECIFY)	-7	-7

(IF ROUTINE DUTY BODY ARMOR NOT MENTIONED IN Q.2 OR Q.3, ASK Q.4 & 5, THEN SKIP TO Q.11)  
(IF ROUTINE DUTY BODY ARMOR MENTIONED IN Q.2 OR Q.3, SKIP TO Q.6)  
(TAKE BACK CARD "1")

4. Why is it that your (force) (company) does not issue routine duty body armor?

15-

16-

5. Would a member of your (force) (staff) be free to purchase routine duty body armor with his own money, if he wished?

Yes	17-1	} (SKIP TO Q.11)
No	-2	

6. What type of routine duty body armor is that? That is:

a. What type of material is it made from? PROBE: Is it made from metal or some other kind of material?

Metal	18-1
Other material _____	-2
(SPECIFY)	
Don't Know	-3

b. Who is the manufacturer?

19-

(HAND RESPONDENT CARD "2")

7. For which of the following activities listed on this card would your (force) (staff) ever use the routine duty body armor? (RECORD BELOW UNDER Q.7, "EVER USE")

8. (FOR EACH ACTIVITY MENTIONED IN Q.7, ASK:)

Would the routine duty body armor, worn for (FROM Q.7) use, be worn on a routine basis or for special situations only? (RECORD BELOW UNDER Q.8)

Q.8			
	Q.7 EVER USE	ROUTINE SPECIAL SITUATIONS	
		ROUTINE	SPECIAL SITUATIONS
Foot patrol, day	20 -1	2	3
Foot patrol, evening	21 -1	2	3
Auto patrol, day	22 -1	2	3
Auto patrol, evening	23 -1	2	3
Desk sergeant, etc.	24 -1	2	3
Detective	25 -1	2	3
Motorcycle patrol	26 -1	2	3
Jail/Prison guard	27 -1	2	3
Tactical squad	28 -1	2	3
Other _____	-1	2	3
(SPECIFY)			
_____			
(SPECIFY)			

(TAKE BACK CARD "2")

29-

30-

31-

32-

(ASK ONLY OF THOSE WHO "NOW USE" ROUTINE DUTY BODY ARMOR, SEE Q.2)

9. Overall, how satisfied would you say you are with this body armor for your (force) (company)? Would you say . . . (READ CATEGORIES)

Very satisfied	33-1
Somewhat satisfied	-2
Somewhat dissatisfied	-3
Very dissatisfied	-4

10. Why do you say that?

34-  
35-  
36-  
37-

(ASK EVERYONE)

11. Thinking about the characteristics and design elements of routine duty body armor, what do you consider important features that would be necessary for you to recommend purchase of such items?

38-  
39-

12. Have you seen or heard about a new type of routine duty body armor made of woven synthetic fabric?

Yes 40-1 (ASK Q.13)

No -2 (GO ON TO Q.17)

13. Please tell me where and how you first learned about this new routine duty body armor?

41-

42-

14. What are your general impressions about the new body armor? PROBE: What other impressions do you have of the new routine duty body armor made of woven synthetic fabric?

43-

44-

15. Do you intend to order, or have you already ordered, this new routine duty body armor?

Have already ordered 45-1 } (GO ON TO Q.17)  
Intend to order -2 }  
Do not intend to order -3 (ASK Q.16)

16. Why is it that you don't intend to order the new body armor?

46-

47-

(HAND RESPONDENT "CONCEPT CARD", THE SAMPLE OF THE MATERIAL, AND FOUR PHOTOGRAPHS. ALLOW RESPONDENT SUFFICIENT TIME TO EXAMINE EXHIBIT MATERIALS.)

(ASK EVERYONE)

17. As far as you are concerned, what, if anything, do you like about the product? PROBE: What else do you like about it? PROBE: What else?

48-

49-

50-

18. On the other hand, what, if anything, do you dislike about the product? PROBE: What else do you dislike about it? PROBE: What else?

51-

52-

53-

19. Everything considered, what is your overall impression of the product? Would you say it is: (READ CATEGORIES)

An excellent product	54-1
A good product	-2
A fair product	-3
A poor product	-4

(TAKE BACK "CONCEPT CARD", THE SAMPLE OF MATERIAL, AND FOUR PHOTOGRAPHS)

(HAND RESPONDENT "STATEMENT LISTING SHEET")

20. Listed on this page are some comments which have been made about routine duty body armor. Please indicate how much you agree or disagree with each statement by circling the appropriate number opposite each statement.

(TAKE BACK "STATEMENT LISTING SHEET" AND HAND RESPONDENT CARD "2")

21. If this body armor were available for any of the activities listed on this card, for which of them do you think your (force) (company) would ever use it? (RECORD BELOW UNDER Q.21, "EVER USE")

22. (FOR EACH ACTIVITY MENTIONED IN Q.21, ASK:) When used for (FROM Q.21) duty, do you think this body armor would be worn on a routine basis, or only for special situations? (RECORD BELOW UNDER Q.22)

	Q.21 EVER USE	Q.22	
		ROUTINE	SPECIAL SITUATIONS
Foot patrol, day	55 -1	2	3
Foot patrol, evening	56 -1	2	3
Auto patrol, day	57 -1	2	3
Auto patrol, evening	58 -1	2	3
Desk sergeant, etc.	59 -1	2	3
Detective	60 -1	2	3
Motorcycle patrol	61 -1	2	3
Jail/Prison guard	62 -1	2	3
Tactical squad	63 -1	2	3
Other _____ (SPECIFY)	-1	2	3
_____	-1	2	3
(SPECIFY)			

(TAKE BACK CARD "2" AND GO ON TO Q.23)

(SHOW RESPONDENT FOUR PHOTOGRAPHS SHOWING PROTOTYPE GARMENTS AND HAND RESPONDENT CARD "3")

23. Here are some pictures of routine duty body armor garments made from the new material, and this card shows how much each garment is likely to cost. Which, if any, of the nine garments shown in these pictures do you think your (force) (company) would be likely to purchase over the next several years? PROBE: What others? PROBE: Any others? (RECORD BELOW UNDER Q.23, "Would Be Likely To Purchase At All")
24. (FOR EACH ITEM MENTIONED IN Q.23, ASK:) As best you can estimate, how many units of the (FROM Q.23) do you think your (force) (company) would be likely to purchase in your fiscal 1977, the first year it will be available? (RECORD BELOW UNDER Q.24, "#Of Units Would Purchase Fiscal 1977")
25. (FOR EACH ITEM MENTIONED IN Q.23, ASK:) Assuming the garments perform well, how many units of the (FROM Q.23) do you think your (force) (company) will order, on the average, each year after that? (RECORD BELOW UNDER Q.25, "#Of Units Average Purchase")

	Q.23	Q.24	Q.25
	Would Be Likely To Purchase At All	# Of Units Would Purchase Fiscal 1977	# Of Units Average Purchase
Undershirt	68-1		
Dress vest	-2		
Sport coat	-3		
Motorcycle jacket	-4		
Scooter coat	-5		
Trooper coat	-6		
Vinyl patrol jacket	-7		
Officer's coat	-8		
Cloth jacket	-9		
None	-0	(GO ON TO Q.26)	
Don't Know	-X		

(TAKE BACK PHOTOGRAPHS AND CARD "3")



(ASK ONLY THOSE WHO SAID "NONE" OR DON'T KNOW" TO Q.23)

26. Why do you say that?

69-

70-

71-

And finally, I have just a few more general questions to ask you.

27. How many people in total are there (on the force) (in the company)?

72-

28. Approximately how many of them would you say are under threat of violence in their jobs?

73-

May I ask your:

RESPONDENT'S NAME: \_\_\_\_\_

POSITION/TITLE (RANK): \_\_\_\_\_ 74-

THE NUMBER OF YEARS YOU HAVE BEEN WITH THE (FORCE) (COMPANY) \_\_\_\_\_ 75-

OFFICE TELEPHONE NUMBER: \_\_\_\_\_ 76-

77-

78-

79-

80-

(ASK ONLY OF THOSE NOT IN LAW ENFORCEMENT)

COMPANY NAME: \_\_\_\_\_

TYPE OF COMPANY: \_\_\_\_\_

COMPANY ADDRESS: \_\_\_\_\_  
(CITY)

STATE: \_\_\_\_\_

(ASK ONLY OF LAW ENFORCEMENT RESPONDENTS)

NAME OF LAW ENFORCEMENT AGENCY: \_\_\_\_\_

JURISDICTION: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

INTERVIEWER: \_\_\_\_\_

DATE: \_\_\_\_\_ TIME ENDED: \_\_\_\_\_

TOTAL INTERVIEW LENGTH: \_\_\_\_\_

FOR OFFICE USE:

Validated by: \_\_\_\_\_

Date: \_\_\_\_\_

Outcome: \_\_\_\_\_

STATEMENT LISTING SHEET

Listed on this page are some comments which have been made about the idea of lightweight body armor. Please indicate how much you agree or disagree with each statement by circling the appropriate number opposite the statement -- a "1" for agree completely, a "2" for tend to agree, a "3" for tend to disagree, or a "4" for disagree completely.

	<u>Agree Completely</u>	<u>Tend to Agree</u>	<u>Tend to Disagree</u>	<u>Disagree Completely</u>	
Once criminals become aware that the authorities are wearing body armor, they'll begin to use higher threat weapons or to aim for the head.	1	2	3	4	12-
Widespread armor usage by the authorities could lead to a false sense of security on their part.	1	2	3	4	13-
Widespread police armor usage could lead to a more aggressive attitude on the part of the police.	1	2	3	4	14-
In a short time, criminals would also acquire the lightweight body armor.	1	2	3	4	15-
Widespread armor usage would create a psychological barrier between the police and the general public.	1	2	3	4	16-

CARD "1"

Hand-held ballistic shields

Patrol car armor

Ballistic helmets

Special armored cars

Routine duty body armor

Flak jackets and other special  
situation body armor

Other

12.01.41

12.

12.01.41

12.01.41

12.01.41

12.01.41

CARD "2"

- Foot patrol, day
- Foot patrol, evening
- Auto patrol, day
- Auto patrol, evening
- Desk sergeant, etc.
- Detective
- Motorcycle patrol
- Jail/Prison guard
- Tactical squad
- Other

CONCEPT CARD

This new body armor is both lightweight and durable. It is made of seven layers of a woven material called Kevlar. It will not be penetrated by .38 or smaller caliber bullets, even fired at close range. These calibers account for 95% of the handguns confiscated by law enforcement agencies. If there were any injury to the wearer from a bullet fired at close range, it would result from blunt trauma effect. Additionally, the material is highly resistant to penetration by a knife or razor.

Prototype garments (undershirts, sports jackets, and uniform components) have been produced and successfully tested for wearability. These garments are less than half the weight of commercially available nylon protective garments, and can be worn for routine patrol operations during most of the year. There is no hindrance in movement when wearing such items. Cleaning can be performed on the items, using a light grade laundry soap.

The estimated average life of garments made of the material is two to three years.

CARD "3"

<u>Garments:</u>	<u>Cost</u>
Undershirt	- \$210
Dress vest	- \$210
Sport coat	- \$420
Motorcycle jacket	- \$325
Scooter coat	- \$325
Trooper coat	- \$325
Vinyl patrol jacket	- \$325
Officer's coat	- \$325
Cloth jacket	- \$325



Motorcycle Jacket



Vinyl Patrol Jacket



Scooter Coat



Officer's Coat



Trooper Coat



Cloth Jacket

Prototype Police Uniform Protective Garments





Sport Coat



Dress Vest, Buttoned



Dress Vest, Unfastened

Prototype Civilian Protective Garments

**END**