

# **24<sup>th</sup> Voorburg Group Meeting**

**Oslo, Norway**

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Revisited Sector Paper on:

**NACE / ISIC 80**

**Security and Investigation activities**

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## 1 Introduction

The Voorburg Group first studied price indices for security and investigation activities in 1992 with a report on a test index produced by INSEE.<sup>1</sup> Additional work and reports from Finland<sup>2</sup>, Israel<sup>3</sup>, Japan<sup>4</sup> and the United States<sup>5</sup> at the 2004 and 2005 Voorburg Group Meeting in Ottawa and Helsinki resulted in a summary presentation on SPPI for security services.<sup>6</sup> The Voorburg Group has not produced papers on the collection of turnover data for security and investigation services in the past so that will be covered for the first time in this revisited sector paper.

This revisited sector paper identifies the challenges associated with classification of security and investigation activities, collection of turnover data, and developing producer price indices of various security and investigation activities. The paper provides some options and notes the implications of the choices that must be made when endeavoring to develop or revise turnover statistics and price deflators for security and investigation activities.

In order to facilitate this paper, a survey was conducted among the member states of the Voorburg Group to track their practices in the field of turnover/output and SPPI statistics for the security and investigation sector. 13 countries replied: 11 give all the requested information about the survey, 2 countries do not plan to calculate an SPPI for this sector.

References are included throughout this revisited sector paper to previous work of the Voorburg Group. It presents that previous work in combination with new developments in the consistent framework of the sector paper adopted by the Voorburg Group in 2006 with the adoption of the content development framework.

## 2 Classification

Classification of security and investigation activities and products in both industry and product classifications generally focuses on three primary groups of products or activities: the first consists of the private security services; the second of the security systems services and the third of the investigation services.

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<sup>1</sup> Ridgeway (1992). The test was a first attempt to survey prices of the service industry.

<sup>2</sup> Järvinen and Harjunpää (2004)

<sup>3</sup> Assaf (2005)

<sup>4</sup> Utsunomiya and Moriya (2005)

<sup>5</sup> Page (2005)

<sup>6</sup> Harjunpää (2005)

## 2.1 Industry Classification

Most industrial classifications used by Voorburg Group participants are comparable in the area of security activities at some level of aggregation.

NACE Revision 2 (2008)<sup>7</sup> and ISIC Revision 4 (2008)<sup>8</sup> split the sector into the three classes: 801 private security services activities (including armored car and security guard services), 802 security systems services and 803 investigation services.

NAICS (2007)<sup>9</sup>, as configured for the United States and Canada, structured the sector into two classes: 56161, investigation, guard, and armored car services and 56162, security systems services.

Beyond the basic split identified in the three industry classifications, NAICS makes finer delineations and identifies two separate classes for security systems services: 561621 security systems services (except Locksmiths) and 561622 Locksmiths.

## 2.2 Product Classification

Product classifications in use throughout the world also have largely comparable structures and details. In general, armored car services, guard services, other security services, security systems services and investigation services are separately identified in most product classifications. The following is a brief presentation of the details used in the CPC Version 2.0<sup>10</sup>, the CPA 2008<sup>11</sup> used in European countries, and the provisional NAPCS<sup>12</sup> work.

The CPA products identified for investigation and security services are very close to the CPC products:

**Table 1: Comparison CPA - CPC**

CPA 2008	CPC 2.0	Description
80	852	Investigation and security services
80.10		Private security services
80.10.11	8524	Armored car services
80.10.12	8525	Guard services
80.10.19	8529	Other security services

<sup>7</sup> Statistical Classification of Economic Activities in the European Community, Revision 2, 2008 (NACE Rev. 2)

<sup>8</sup> International Standard Industrial Classification of All Economic Activities, Revision 4, 2008 (ISIC Rev. 4),

<sup>9</sup> North American Industry Classification System (NAICS 2007),

<sup>10</sup> Central Product Classification, version 2 (2008),

<sup>11</sup> Statistical Classification of Products by Activity in the European Economic Community, version 2008 (CPA),

<sup>12</sup> North American Product Classification System (NAPCS),

latest accessed 25 June 2009: [www.census.gov/eos/www/napcs/napcs.htm](http://www.census.gov/eos/www/napcs/napcs.htm)

80.20		Security systems services
n/a	8522	Security consulting services
80.20.10	8523	Security systems services
80.30		Investigation services
80.30.10	8521	Investigation services

However, differences occur for security consulting services: CPC covers security consulting services whereas CPA includes only such security consulting services which are not a stand-alone service from the security sector.

The NAPCS used in the US in general follows a similar breakdown for the product approach (see below group 1 “Investigation and security services”). In addition a sectoral approach for companies of the security and investigation industry is applied including also all related products (see group 2 “Related products”).

The list below is provisional:

- 1 Investigation and security services
  - 1.1 Investigation services
  - 1.2 Security guard and patrol services
  - 1.3 Bodyguard services
  - 1.4 Armored car services
  - 1.5 Building security system monitoring services
  - 1.6 Building security system and lock installation and repair services
  - 1.7 Other security system and lock services
- 2 Related products
  - 2.1 Security consulting services
  - 2.2 Security training services
  - 2.3 Reselling services for merchandise, retail
  - 2.4 Rental and leasing of locks, security systems, safes, and other equipment
  - 2.5 Architectural armoring services
  - 2.6 Vehicle armoring services
  - 2.7 Cash handling and management products
  - 2.9 Other related products

There are 19 more detailed products separating out types of investigation, security guard, armored car, monitoring systems and other services identified in the NAPCS work to date. A full list of products is available at: [www.census.gov/eos/www/napcs/napcs.htm](http://www.census.gov/eos/www/napcs/napcs.htm).

All those product classifications are very detailed. When compiling statistical data in such a detailed structure, it has to be secured that the sample size is large enough to get reliable results. Especially for SPPIs, the countries tend to publish only few, but robust sub-indices.

Practices in the security sector vary across countries. However, to the extent possible given by market conditions, it is recommended that product classifications be developed

that will map to the generally accepted breakdowns included above. This will increase international comparability but also separate products and product groups based on different measurement variables and practices.

### 3 Turnover Statistics

As noted in the Introduction, the Voorburg Group has previously not addressed turnover practices in the investigation and security activities and products area. The recommended development options presented here are based on a survey of 11 countries producing turnover statistics in advance of the 2009 meeting in Oslo, Norway.

The price for security and investigation services – forming the revenue and adding up to the turnover to be measured – is normally based on a contract and can be directly measured. Additional expenses have to be included in the turnover figure as well.

Depending on the sample, turnover data are collected yearly in the Structural Business Survey (SBS), monthly or quarterly in the Short Term Statistics Survey (STS). Most countries use a survey to collect the turnover data for the security and investigation services industry. In the UK, turnover data are collected by a census. Because of legal requirements Germany uses for the STS-Survey a combination of a survey (among companies with a least 15 million Euro annual turnover and/or 250 persons employed) and administrative (fiscal) data (for all other enterprises). Finland uses for the STS also a combination of survey and administrative data. The STS-Survey in Israel comprehends data from tax authorities.

Security and investigation companies sometimes offer services belonging to other service sectors. This may include cleaning services. When turnover collection is based on products, it is recommended to survey the companies for all activities they do, so a real product-based turnover data can be achieved. It is not a challenge for an industry-based approach, where the main activity counts. However, most countries offer turnover data for sub-sectors as well. Especially when publishing very detailed data, it is a must to check that the assignment of the respondents to the sector is correct. NSOs that use surveys or census for measuring turnover do this by questioning the activity of the responding companies.

It is an even harder task for checking administrative data<sup>13</sup>. For that purpose, the NSOs may apply the following methods:

- Combining information from different administrative data sources: companies are listed in different registers like the business register, tax register, social security files and so on. Most of them have an indicator for the sector which the company belongs to. By combining the information, it is more likely to identify misclassified companies, leaving the question which source provides the correct classification.

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<sup>13</sup> The following two chapters are based on Goldhammer (2008); the usage of administrative data for turnover statistics seems to be quite similar for most of the service sectors.

- Data in the registers is improved by personal visits of the companies and surveys for re-classification. Those surveys are done when the classification system changes. In case of the NACE revision in Germany it was shown that this is expensive and cannot be done for all (especially the smaller) companies.
- Combination of sample and administrative data: While information about all companies is derived from registers, some of them are sampled in a representative way and checked for their activities and other data. The administrative data can then be adjusted by the figures from the sample survey.<sup>14</sup>

A big problem with the use of administrative data is that it has not been designed to obtain statistical economic indicators. E.g., data from the tax authorities in Germany has the following points:<sup>15</sup>

- Definition of “turnover” is different: e.g., the tax authority includes sales of assets which are not included in what turnover statistics want to measure.
- Large corporate groups with many small subsidiaries are treated as one company by the tax authority; hence, turnover gained by sales between those subsidiaries is not counted - a mistake in terms of turnover as an economic indicator.
- Turnover for which no tax is paid is quoted, but often in doubtful quality.

When using only administrative data, NSOs must be aware of weaknesses like that and find appropriate remedies.

For developing turnover statistics, the NSOs may follow the approaches listed in the table below. Which option is chosen, largely depends on the purpose of the statistics (e.g., economic indicator or input of National Accounts), on the resources and political conditions.

**Table 2: Options for Developing Turnover Statistics – security and investigation activities<sup>16</sup>**

Category	Data Source	Level of Detail Collected	Frequency	Cost	Comments
Best	Survey/Census	Industry turnover <u>and</u> product turnover detail;	Sub-annual collection (monthly or quarterly)	- Most expensive - Largest response burden	- Allows greatest flexibility to identify specific revenue streams, residential and non-residential allocations can be collected directly. - Timely data
Good	Survey/Census	Industry detail <u>only</u>	Sub-annual	- Expensive - High response	- Industry detail may not be sufficient to

<sup>14</sup> Currently, Germany is planning to apply this approach for the 2011 population census.

<sup>15</sup> Kaumanns/Schelhase (2007), p. 769ff.

<sup>16</sup> The table is based on Murphy (2008); turnover statistics seem to be quite similar for most of the service sectors.

				burden	delineate sources of revenue or important residential/non-residential components using ISIC. - Timely data
Good	Combination of census (large companies) and administrative data	Industry detail <u>only</u>	Sub-annual	- Less expensive - low response burden	- Industry detail may not be sufficient. - Timeliness questioned - Different definitions for turnover in administrative data files may cause (justifiable) bias
Minimum	Administrative (tax data, industry association data etc.,)	Industry detail <u>only</u>	Annual	- Least expensive - Little or no respondent burden	- Income and production definitions can differ adding imprecision to estimates using tax data in place of actual revenue received for services - Least timely

### 3.1 Other Considerations

The surveyed NSOs identified the following major challenges in developing turnover statistics:

- Quality problems of the business register: companies in the business registers are often mis-classified
- Turnover data from different sources might differ to a large extent (for instance tax turnover and survey turnover)
- There is no EU legal requirement to collect product level turnover data for this sector. As a result it is difficult to justify collecting detailed on the national level (Ireland)
- To know the evolution of the economic cycle in this sector (Spain)

Turnover data collections also provide the opportunity to collect additional information that is not product-related. It is fairly common to collect employment levels, payroll data, and other variables as part of turnover surveys. This can help to improve other surveys and registers as well.

Communication between national accountants and turnover statisticians about the methods being used in national accounts will help ensure that efforts are in line and the resulting statistics will be as applicable as possible. However, national accounts is not the only user of turnover data so it is important to ensure that other needs are met as they are identified as important. Definitions on national and international level need to be standardized and statistical requests taken into account in the legislation processes where the collection of administrative data is concerned.

#### **4 SPPI Statistics**

Rather than present a tabular set of recommendations for the development of service price indices, a review of the common practices and recommended methods of addressing those practices will provide a more thorough set of development options. Because of variations in the practices within industries and even within firms, the actual practices and availability of data will determine the most appropriate method(s) of estimating price

As noted in the introduction, the Voorburg Group first studies price indices for security and investigation activities in 1992, with a report on a test index produced by INSEE. Papers describing methods used in Finland, Japan, United States and Israel, were presented at the 2004 and 2005 Voorburg group meetings in Ottawa and Helsinki.

The recommended development options presented here are based on papers presented at Voorburg Group meetings and a survey that was conducted among the member states of the Voorburg Group in advance of the 2009 meeting in Oslo, Norway. (Responses were accepted from 13 countries, 11 already developed SPPI for that industry and 2 countries don't have plans to develop soon).

According to the classifications used by Voorburg Group participants, security and investigation include 3 main classes: the first consist of private security services (including armored car and security guard), the second of security system services and the third of investigation services. The services under these classes include:

- surveillance, guard and other protective activities:
- Transport of valuables
- Bodyguard activities
- street patrol, guard and watchman activities for apartment buildings, offices, factories, construction sites, hotels, theatres, dance halls, sport stadiums, shopping centers etc.
- Security activities in the field of public transportation such as luggage and passenger inspection at airports as well as patrol activities in trains and subways
- store detective activities
- Remote-controlled supervision/inspection of technical equipment, buildings etc.
- Pre-qualification of alarms (deciding whether it is a false alarm or not) and calling police, fire brigade and ambulances if necessary
- Consultancy in the field of industrial, household and public service security including security screening

- Activities of private investigators

In practice most of the countries focus on the first group: private security services which usually generate the vast majority of turnover; only some of the countries cover investigation or system security services.

The industry's main customers are other businesses and the public sector. Demand by households makes only a minor part of the industry's total demand.

The Business Register is used as a sample frame in all countries. The variations are in the methods for determining the sample of firms. The most popular approach, in line with the recommendation of the SPPI methodological guide, is PPS sampling (probability proportional for size). It is often combined with a cut-off limit criteria, for example: only companies with a turnover above certain level are included in the sample. Including the largest companies helps to achieve a significant share of turnover.

The criterion on which PPS sampling is based is either turnover or number of employees. A cut-off sampling is used when the industry is highly centralized, in Austria, Israel, Spain and Finland.

In most countries prices are collected directly from sampled firms, usually by visiting the companies at the initial data collection stage and then by mail, telephone or fax.

The selection of the pricing methods must take into account the special characteristics of pricing in the industry. Long-term contracts tailored to customer needs and specifying in great detail the content and the price of the service concerned for the entire contract duration, are typical in the investigation and security service industry. Such contracts are prevalent in the large companies of the industry, and their prices are determined by negotiation.

Contract pricing is the dominant method in that industry. The contracts are selected in cooperation with companies. The contract specify the detail of the service provided: the kind of service, the time and the place where the service is provided, details of staff: skills and experience and equipment, transportation etc. The main price determining characters of service are:

- Type of service
- Customer type and field of activity
- Location where the service is provided
- Guard type and professional level: age, experience, training, skills, equipment (armed / unarmed)
- Time when the service is provided (time of the day and week)

When using this pricing method it is important to be in close contact with the respondents and a special effort should be made to ensure that the contents of the contracts remain unchanged over time. One way of doing that is by collecting information on possible quality changes in each period. If there has been a change in contents, steps have to be taken to allow for a change in quality.

Countries that use contract pricing as main method for price collection are: Finland, Japan, US, Spain, Germany, UK, Sweden, the Czech Republic and Israel (use a mix of hourly charge out rates and contract pricing).

Other methods used are: model pricing, time-based methods and direct price for repeated services. In the case of time-based methods it is necessary to divide the staff into different categories according to the kind of staff, level of experience and skills. Typical categories may include: Unarmed-guard, Armed-guard, Bodyguard, Explosive guard etc.

In the Czech Republic, Finland and Germany contract prices covering private security services. In Sweden and in the UK the index covers only security system services.

In Austria and Spain different methods are used for different sub-groups. In Austria model pricing is used for private security services and time-based methods for investigation. In Spain contract pricing are used for security systems services, time-based methods for guard security and prices of repeated services for armored car (transferring money).

In the US the most common type of price is contract pricing. The contracts break up the charges based on the working time of each employee that works on the project. The service may include charges other than those for labor, such as itemized charges for patrol cars. Another method used is Model Pricing and it depends on the willingness of the respondent to provide a model. Those transactions also commonly include a breakdown of the working time for specified personnel.

In Israel hourly charge out rates are collected for employee specified in the contract. The contracts specify the kind of service, the customer, guards professional level (unarmed, armed, security guard, bodyguard), type and equipment of the guard and job location. The characteristics of the guard include age and experience in military service. Less common are contract prices for long period when the price reflects total charges. Direct prices for repeated investigation services are also used.

In Ireland hourly charge out rates are collected for private security services and investigation. The staff is divided according to experience and number of years with the firm (for example: <2 and>5years).

The Netherlands use model pricing by identifying the object and the services: the place, the activities, time of the day and the total time.

**Table 3: Examples of the different pricing methods**

<b>Pricing method</b>	<b>Example</b>	<b>Sub-group</b>
Contract pricing	Cash delivery of all subsidiaries of the client; 538 stops per month 1 stop is calculated at 5 minutes, 2 employee	Armored car
Contract pricing	Uniformed guards, mobile site customer X 2 visit per night, 7 days a week , price per week	Security guard
Model pricing	Security of building A Object: 2 exits, 20 people working Activities: opening & closing rounds Time: 7:00-19:00 total price:	Security of building
Time-based methods	Average price per hour for bodyguard	Guard security
Price of repeated services	Investigation for private customer for one tracking	investigation

**Table 4: Choices for Developing SPPI Statistics**

<b>Category</b>	<b>Pricing method</b>	<b>Data type in the survey and frequency</b>	<b>Quality and Accuracy</b>	<b>Cost</b>
Best	Observed Transaction prices: Contract pricing or prices for repeated services	Data are based on real transaction prices	Advantage: Real transaction prices give an accurate price index that is representative for the industry. Disadvantages: Hard to find and specify repeatable services.	Relatively high, much work in order to maintain constant quality. A big sample of contracts is needed
Good	Model pricing	Price based on expert estimates. By using a fictitious service or a real service as a model	Advantages; Holding constant quality  Disadvantages:	High
Minimum	Time-based methods	The price for the time spent on the service is used as a proxy for the real price	Advantages: The information is available  Disadvantages: Not reflecting productivity changes	low

## 4.1 Main issues with the measurement of price indices

### **Advantages and disadvantages of contract pricing:**

When the contracts are well selected, contract pricing gives an accurate picture of a real transaction's price movements.

The greatest shortcoming of the contract pricing method is that it requires a considerable initial effort from the data supplier to select the representative transactions and to specify all the price determining characters. In addition it has to be ensured that all the price determining characteristics are specified in the sample contracts. On the other hand once the contracts have been selected collecting prices is a cost-effective method. Other problem is the timeliness of price data; changes are not shown quickly as in list price, and are often adjusted once a year. Quality changes between new and old contracts caused by dissimilarities are a potential problem.

### **Quality change**

Maintaining constant quality through time represents an ongoing challenge for that industry; this is addressed by closely monitoring changes in the quality of the services. If a contract is changed a decision should be made whether to make a direct comparison or if a quality adjustment is needed. The ideal is to substitute an old contract with an identical new one, but this is not always possible. It may be possible to quantify a change in the quality of the services. When an old contract is substituted with a new one that isn't the same, a valuation of the quality differences must be carried out. If the contract is renewed or replaced by a contract with the same content but a quantifiable factor has been changed (size of premises, number of hours etc') a quantity conversion can be performed. When the contract is replaced by a different content service and the difference can be quantified in terms of costs, the differences in production costs can be used for quality adjustments. It is not always possible to obtain the exact cost information of the quality change but since security services heavily depends on labor costs the cost difference can be calculated based on personnel costs.

Another method used for quality adjustment is the overlap method in which price differences are regarded as of quality changes. Such an adjustment keeps the same index level as before. The overlap method is applicable to cases in which the two services coexist simultaneously, in which the transaction volume of both is stable and in which prices can be assumed to move in the same way. In addition it should be assumed that full information is available. This method should be used carefully for services provided to enterprises, especially in the case of unique contracts between service provider and clients when the condition of full information is often not met and price paid by different clients can vary significantly due to lack of information and not to quality differences.

Spain, Finland, the Netherlands and the Czech Republic use the overlap method for quality change. The UK use a similar method, so if the change in contract reflects a change in quality the index level remains the same.

In Sweden, US, Japan and Germany an attempt is made to evaluate the change in quality. In Sweden and Japan<sup>17</sup>, if a quantifiable factor is changed a quantity conversion is performed, or if the differences between the old and new contracts can be quantified in terms of costs, the differences in cost are used for quality adjustments. For example if the number of guards in the new contract decreases, then the new price is the old price minus the decrease in costs.

Example 1 represents the production cost method: the price for guarding an office building is determined by guard costs. Suppose that the price for guarding reduces from 480\$ to 350\$ and the company reports that the number of guards reduced from 4 to 3 in this case the differences between the new price (350\$) and the quality adjusted old price (360\$) obtained from the old price (480\$) minus the decrease in cost (120\$).

Example 1: (US\$)

	Price N-1	Price N	Price change (%)
	480	350	
Change in cost	-120		
Quality adjusted price	360		-2.8

In the US the respondent is contacted in order to determine the effect of the change and to gather information about the cost to the firm of providing the improvements. This approach is problematic, as respondents are often unable to estimate the costs of the quality. For now they are researching the possibility of using hedonics.

In Germany expert estimations help to determine the price change between old and new contracts. Therefore a questionnaire was developed comparing the new realized hourly rate with the old one with a similar service, the expert of the responding company is asked for the percentage rate of change.

## 5 Summary and Further Suggestions

Regarding classification: Most industrial classifications used are comparable in the area of security activities at some level of aggregation. Product classifications in use throughout the world also have largely comparable structures and are very detailed.

Most countries use a survey to collect the turnover data for the security and investigation services industry. For the STS-Survey some countries use a combination of survey and administrative data.

When using administrative data NSOs could combine information from various administrative data sources to identify misclassified companies. When using a

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<sup>17</sup> Utsunomiya and Moriya (2005)

combination of sample and administrative data the administrative data can be adjusted by the figures from the sample survey.

Security and investigation companies sometimes offer services belonging to other service sectors, usually cleaning services. When turnover collection is based on products, it is recommended to survey the companies for all activities they conduct, so a real product based turnover data can be achieved.

The best approach recommended for developing turnover statistics in the security and investigation sector, is to collect detailed turnover data for industry and product based on a survey. The shortcoming of this approach is that it is the most expensive and creates the largest burden on respondents. Choosing an option depends on the purpose of the statistics, however NSOs have to ensure that all needs are met (national accounts and other users).

In the security and investigation industry contract pricing is the dominant approach that reflects the characteristics of that industry. Long-term contracts tailored to customer needs are typical in that industry. The contracts specify the details about the type of service, customer type and field of activity, location and time of providing the service, guard type and professional level (e.g. age, experience, skills, equipment, etc.). Close contact with respondents is necessary when using this pricing method to be prepared for quality changes.

## APPENDIX

### A. Overview of International Progress

In advance of the 24<sup>th</sup> Voorburg group meeting in Oslo, Norway, countries were asked to provide an aggregate status progress report for a selected group of industries that have been covered in the past in order to track progress over time. As of August 2009 usable results were received from 20 countries. The inquiry asked for each ISIC industry a yes or no answer to coverage in turnover and SPPI along with a start date. The results of the inquiry for 3 sub-groups of ISIC/NACE 80 are summarized in the table below:

**Table 5: Results of progress report inquiry for ISIC/NACE 80**

ISIC/NACE	SPPI	TURNOVER
8010 – PRIVATE SECURITY SERVICES	15	16
8020 – SECURITY SYSTEM SERVICES	12	16
8030 – INVESTIGATION	7	15

### B. Example of Contract pricing in the U.S.

CORPORATE SECURITY SERVICES. CONTRACT NUMBER: 69245. TYPE OF BUILDING/FACILITY: CLASS A OFFICE BLDG. 1 YEAR CONTRACT. NON-UNION. 24 HOURS OF BASIC TRAINING. 16 HOURS OF ON THE JOB TRAINING. 16 HOURS OF REFRESHER TRAINING. HEALTH INSURANCE. DENTAL INSURANCE. LIFE INSURANCE. VACATION. NUMBER OF HOLIDAYS RECOGNIZED: 8. 401K. BLAZER STYLE UNIFORM. UNARMED. TWO-WAY RADIOS.

OFFICER TYPE/LEVEL	RATE PER HOUR	# OF HOURS PER WEEK	TOTAL
PATROL OFFICER	\$15.65	304	\$4,757.60
SHIFT SUPERVISOR	\$17.88	168	\$3,003.84
ACCOUNT MGR	\$42.00	40	\$1,680.00
TOTAL			\$9,441.44
SERVICE PATROL CAR	\$20.00	80	\$1,600.00
TOTAL			\$11,041.44

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