EXAMINING THE WORK SCHEDULES:
Satisfaction of Organizational and Personnel Demands

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DEDICATION

I dedicate my dissertation work to my family; my lovely wife Nurdan, F.Burak, Gaye, and Merve for their patience and understanding. I also dedicate this dissertation to the memory of my father, Nurettin, who gave me the strength and courage to fulfil my dreams, my mother, Guler, my brothers, Faruk and Ferit, and my lovely sister Esra for being there for me throughout the entire doctorate program. I will always appreciate all they have done, especially my mother in law, brothers in law, and sister in law. I must also thank to Katie for the many hours of proofreading, to my sister's husband Huseyin and Mesut for assisting me to conduct survey, and to my friends, Hilmi, Ali, Nuri, Fatih, Hamza, Cosar, Ali Can, Bulent, and M. Ozer who have supported me throughout the process.

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ABSTRACT

Examining the Work Schedules: Satisfaction of Organizational and Personnel Demands

Cihangir Baycan

With modern policing approaches, police agencies have been required to question their efficiency and effectiveness to match their limited resources with increased public expectations. As an essential aspect of policing, work schedules have been reconsidered not only to use their resources efficiently and effectively but also to enhance officer's welfare. The purpose of this mixed method study is to examine the work schedules of the Turkish National Police (TNP) in terms of organizational and personnel demands. Organizational demands were investigated based on legal requirements, efficiency, flexibility, and manageability through the collection of secondary data. Personnel demands were measured in a schedule satisfaction survey. In addition, structured interviews were conducted with managers to explore their schedule satisfaction levels and thoughts on the optimum solutions for the work scheduling problem.

This study is expected to contribute to the shift work and scheduling literature as well as to the police work scheduling literature. Also the results of this study which is the first its kind in Turkey, are expected to be a crucial step for solution of the work time arrangement problems which has became a subject of Courts. Recommendations and alternative work schedules are provided to satisfy demands of the TNP and its officers based on work schedule.

Key Words: Work schedule, roster, shift, schedule satisfaction, Turkish National Police.

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LIST OF ABBREVIATIONS

Area of Responsibility	AOR
Attraction-Selection-Attrition	ASA
Compressed Work Week	CWW
Directorate of Province	DOP
European Union	EU
International Labour Organization	ILO
Government Officers Act	GOA
Security Service Act	SSA
Standard Shiftwork Index	SSI
Statistical Package for the Social Sciences	SPSS
Turkish Grand National Assembly	TGNA
Turkish National Police	TNP
Universal Declaration of Human Rights	UDHR
Working Time Circular	WTC
Working Time Directive	WTD

INTRODUCTION

Shift work is an essential feature of today's organizations. Among other reasons, organizations use schedules consisting primarily of shift work in order to use their resources efficiently to meet organizational production or service demands. For employers, this creates the challenging task of balancing satisfaction of organizational demands and employees' preferences for work scheduling. Such a balance requires managers to take into account "employee ability, availability, and desire to work as well as to control labor costs and provide appropriate customer service levels" (Holtom et al., 2002, 903).

Shift working is generally defined as any type of employment and work time arrangements that are outside of traditional working hours (8am to 5pm) and work days (Monday through Friday) (The Council of European Union, 1993; Totterdell, 2005, 35-63; Monk and Folkard, 1992). Work schedule refers to any method of designing work shifts. Work schedules have been categorized or studied by their characteristics including the length of shift (8, 10, 12 hours, etc.), period of shift (morning, evening, or night), direction of rotation (clockwise or counter clockwise), speed of rotation (permanent, fast, and slow), start and end times of shifts, and total working hours in a week/month (Totterdell, 2005, 35-63).

Like all other 24-hour service providers, police agencies use different types of shift work to maintain public safety. Police agencies, especially with the development

of the community policing philosophy and its practices, have required modification of their work schedules. Agencies have developed new schedules to make those philosophies work effectively and efficiently with their limited human resources (Peak et al., 2004). An early report on the police work scheduling for the United States Department of Justice revealed that an "effective work schedule can produce: reduced sick leave, increased incentive to work, less wasted effort, more efficient use of equipment, reduced overtime, increased public service…, more leisure time, higher morale, and enhance recruitment capabilities" (Stenzel and Buren, 1983, 121). Vila emphasizes the relationship between police work schedules and public safety as "tired cops are a public safety hazard" (Vila, 2006, 979).

As a national police department, the Turkish National Police (TNP) needs to design or select best practices for its employees and for the public. The TNP, which was established on 10 April 1845 in Istanbul (Aydin, 1996, 55-68), provides security services with approximately 175,000 sworn police officers and about 20,000 civilian officers within the boundaries of municipalities all over the country (The General Secretary of European Union (GSEU), 2006). Like other public agencies in Turkey, the TNP is a highly centralized organization. Under the Headquarters of the TNP, there are several divisions and 82 Directorates of Province (DOPs), which are connected to the General Director through the Deputy of General Directors (Ozcan and Gultekin, www.lboro.ac.uk). Each DOP has subdivisions and district stations within the boundaries of municipalities. The DOPs are linked to the Ministry of Interior through a Representative of the Ministry (Governor), who is the highest appointed government officer in provinces.

Working hours in the TNP are regulated by the "Working Time Circular" (WTC), which was prepared based on the Government Officers Act (GOA) (WTC,

1995). Before the Circular, the working schedules of DOPs were determined according to their needs and human resource capabilities. This process caused many personnel complaints, dissatisfaction, and low performance among officers. To eliminate those negative impacts of work schedules, the WTC was signed in 1995 by the Ministry of Interior to standardize work schedule practices. The WTC recommends that DOPs implement three types of work schedules or create some type of systems with conditions that satisfy organizational demands, citizen expectations and personnel preferences.

The WTC, in general, led to some improvements in working hours; however, it could not solve all the scheduling problems and complaints. In fact, working hours still seemed to be the most problematic issue among police officers in the TNP (Birsen and Badem, 1997; Duran, 2001; Department of Research and Development, 2001; Baycan, 2004; Zengin, 1997; Ballan, 2001). Actually, problems related to work schedule came to public attention once again with a decision of the Izmir Province Human Rights Committee and with a decision of the European Court of Human Rights (Ozturk and Sancaktar, 2001).

In 2001, a police officer applied to the Human Rights Committee of Izmir Provinces, claiming his work schedule was a violation of human rights. The Committee sent this file to the 9 Eylul University Law School to examine and to provide a report to the Committee. The report, "Whether Police Working Conditions Cause a Violation of Constitutionally and Internationally Guaranteed Rights" was prepared by Ozturk and Sancaktar. The Human Rights Committee declared that the conditions of the officer's working hours were a violation of human rights and advised to the TNP administration to find better schedules in the report. The decision of the Human Rights Committee of Izmir Provinces revealed the importance of this issue for police officers and for the TNP administration (Ozturk and Sancaktar, 2001).

Another court decision on work schedules was in response to the application of Seda Unsal, the wife of a police officer. She sued the Ministry of Interior because of her husband's work schedule and his overtime work (Sahinbas, 2005). She accused her husband's supervisors of compelling her husband to work overtime and changing his schedule, which negatively affected their family life. The Court accepted her application and decided that the administration should provide about $1,250 as compensation. She also applied to the European Court of Human Rights for additional compensation of $35,000. The court accepted her application, which is a very important part of the court process for the procedure of handling a case. The trial has not been resolved yet (Sahinbas, 2005).

In 2006, the Izmir Police Department started a community policing initiative to eliminate complaints on work schedules and to fight increasing crime more efficiently by creating a new patrol unit, "Peace Teams," and by rearranging working hours for its staff (Internethaber.com, 2006). In this approach, police stations became responsible for following the paperwork of the cases brought by patrol units to stations. All the station patrol officers were assigned to one of the two units of the Public Order Department: uniform patrol units or peace teams. Both patrol units were assigned to areas of responsibility (AOR) of the Izmir Police Department, which was divided into five regions—see the shaded area in the map below. In this study, three of these regions were selected. Each unit works with a different work schedule; uniform patrols work with the 12/24 schedule, while peace teams work with an 8-hour daily and 40-hour weekly schedule. The peace teams' schedule can change even daily based on crime trends within an AOR. Huseyin Capkin,[1] the Chief of Police and the founder of the

1 The Chief of Izmir transferred to Istanbul, the biggest city of Turkey, during the present study.

peace teams' working schedule, stated that "Peace teams will be assigned to places where and when they are needed" (Internethaber.com, 2006).

Figure 1. Map of Izmir Province and Area of Five Regions

The decision of the Human Rights Committee of Izmir Province and the following developments make the Izmir police department remarkable among the other DOPs in Turkey. The Committee Report and the new initiative are the main reasons behind the selection of the Izmir Police Department for this study.

Overall, the majority of TNP officers work in shifts and their work schedules, the 12/24, 12/12, and 12/36, must be updated to enhance police services and officers' life quality. As TNP policy makers concurrently deal with institutionalizing the community policing philosophy within the organization, new work schedules would contribute to those practices by increasing employee participation, which is the most important step for community policing (Trojanowicz et al., 1998). The community policing objectives can be achieved by building community involvement and obtaining officers' participation in community policing initiatives (Roberg et al., 2002). The results of this study are expected to contribute to the development of community

policing by providing information and recommendations on work schedules to enhance personnel satisfaction and quality of police services.

1.1. Statement of the Problem

The Public Order Department of the Izmir police department uses two different schedules for its two patrol units. One is the well-known and commonly used 12/24 schedule (Appendix A), and the other one is the flexible work system (Appendix B), which is arranged by the managers of the peace teams with respect to crime trends.

From the literature on the TNP, (Birsen and Badem, 1997; Zengin, 1997; Duran, 2001; Department of Research and Development, 2001; Baycan, 2004; Demir, 2008) we do not know whether organizational demands are satisfied by implementing these shift patterns in Izmir, or whether the differences in area of responsibility and type of patrol unit affect organizational demands satisfaction. In addition, although dissatisfaction with scheduling was found in several studies, it is unknown what factors affect employees' schedule satisfaction and whether the characteristics of employees and regions affect schedule satisfaction. Moreover, we lack knowledge about managers' thoughts on work time arrangements. Do they have any problems related to work schedules, and if so, how do they deal with the problem(s)? What are their recommendation(s) for an optimum solution? Overall, the problem of this study is to investigate how two patrol units with different work schedules satisfy organizational demands and their personnel's individual needs.

In this study, these problems and subjects are analyzed in the following order: first, operational definitions, the purpose of study and research questions are presented. Then, studies on work schedules are reviewed, including those conducted to analyze the effects of various types of schedules and schedule characteristics on employees' satisfaction, and research on police work schedules and on the impact of work schedules

on organizational and personnel demands. As a part of the literature review, the Discrepancy Theory is discussed since it relates to personnel satisfaction on work schedules and the demand management issue. The research design is then provided, including method, data collection strategies, sampling, data analysis, external and internal validity, ethical issues, and the significance and the limitations of the study. Lastly, the findings of the study, discussion on these findings, recommendations and conclusions are presented.

1.2. Definitions

Demand analysis: Demand analysis is a method "used to translate an anticipated pattern of work (e.g., [the number of crime], volume of calls) into work demands" (Wolf et.al., 2006) and "to determine employee scheduling or staffing requirements based on past levels of demand or related variables."(Nanda and J.Browne, 1992, Cited in. Wolf et.al., 2006.)

Organizational demands: Demands that should be met by any work schedule. For this study, those demands are legal demands (national and international), efficiency, flexibility, and manageability.

Personnel demands: Personnel demands are employee's individual, social and family needs. In this study, employees determined their needs by themselves and are asked to evaluate how their schedule satisfies those needs.

Extended work shifts: Extended work shifts are defined as shifts longer than 8 hours (Caruso et.al., 2004; Knauth, 2007, 125-136).

Managers: City Level Managers: Izmir Police Department's ranked officers who responsible for designing or selecting work schedules; *Unit Level Managers*: The Department's ranked officers who work in the uniform patrols or peace teams as chief of patrol, team leaders etc.

Officer/ personnel: Izmir police department ranked or without rank (constables) officers who work in shifts in patrol units.

Overtime: Overtime refers to working hours that are generally, more than 40 hours in a week (OPM; Caruso et.al., 2004).

Schedule efficiency: For a police organization, schedule efficiency is meeting expectations for police service and balancing work and family needs for employees (RCMP, 1995). In this study, schedule efficiency was evaluated through the use of a supply-demand chart. The better supply-demand match, the more efficient the schedule is.

Schedule fit: The degree to which work schedule (i.e., number and distribution of working hours) meets organizational demands and officer's needs as well as the needs of their partners, children, and other dependents (RCMP, 1995, 1).

Shift work: "Any method of organizing work in shifts whereby workers succeed each other at the same work stations according to a certain pattern, including a rotating pattern, and which may be continuous or discontinuous, entailing the need for workers to work at different times over a given period of days or weeks" (The Council of the European Union, 1993, Article. 2/5).

Shifts: The basic units of a work schedule (morning, evening, or night).

Patrol Units: "Patrol units" refers to the uniform patrol and peace teams serve under the Public Order Department.

Work schedule: Work schedule refers to any method of designing work shifts.

Work schedule characteristics: Work schedule characteristics include the length of shift (8, 10, 12 hours, etc.), period of shift (morning, evening, or night), direction of rotation (clockwise-counter clockwise), speed of rotation (permanent, fast, and slow), start and end time of shifts, and total working hours in a week/month (Totterdell, 2005, 35-63).

1.3. Purpose of the Study

The purpose of this mixed method study is to examine work schedules of the Turkish National Police (TNP) in terms of organizational and personnel demands. Organizational demands were investigated based on legal requirements, efficiency, flexibility, and manageability through the collection of secondary data. Personnel demands were measured in a schedule satisfaction survey. In addition, structured interviews were conducted with managers to explore their schedule satisfaction levels and thoughts on the optimum solutions for the work scheduling problem.

1.4. Research Questions

This study addresses nine sub-questions under one main research question. The main research question is as follows: Do the work schedules of the Turkish National Police satisfy organizational and personnel demands? The following questions are the sub-questions of the study:

1.Do the current work schedules implemented in the Izmir patrol units comply with international standards and national regulations?

2.How efficient are the current work schedules in terms of changing workload and crime rates, in each hour of the day, day of the week and season?

3.What work scheduling problems exist, (if any) and their optimum solutions for the Izmir patrol units?

4.To what extent are the schedule's criteria important and fulfilled with the current work schedules?

5.Are there any significant relationships between personal schedule satisfaction/fit and characteristics of the area of responsibility?

6.Are there any significant relationships between schedule satisfaction/fit and type of patrol unit?

7.Are there any significant relationships between schedule satisfaction/fit and personal characteristics?

8.Are there any significant relationships between schedule fit and schedule satisfaction?

9.Do regional and unit-based differences affect the relationships between schedule fit and schedule satisfaction?

LITERATURE REVIEW

Shift work has become more common both in the public and private sector; however, working time arrangements still "appear to pose the greatest problems for organizations and workers" (Taylor and Huxley, 1989, 4). Organizations require that optimum schedules be used to overcome shift work related problems such as low performance, low job satisfaction, and hazardous on employees' health and safety. Developing a schedule has several challenges for administrators due to "varying consumer demand, differences in employee performance levels and preferences, government regulations, and company policies" (Wolf et.al., 2006, 14). On the other hand, a well-designed, efficient work schedule helps organizations to control cost by minimizing personnel shortages and surpluses (Taylor and Huxley, 1989, 903) and better offs workers' health, safety, family life, work satisfaction and productivity (Freesmeyer and Stenzel, 2008, 34; Allen et al., 1999).

Even at the beginning years of the public administration theories, especially with the influence of the scientific management of Frederick W. Taylor, who applied the time-and-motion studies to public activities (Frederickson and Smith, 2003, 95), time management became one of the key issues for public organizations. Taylor, in his study, used the time factor as a tool to find the "one best way" of doing a piece of work. After his findings from the experimental study of pig iron handlers and ball bearing inspectors, he concluded that "fatigue would be reduced and more work would be accomplished if

employees were given shorter working hours and/or rest pause during the day in proportion to the difficulty of the work" (Locke, 1982, 17). Although employees were not in favor of it because of the lost income, Taylor reduced the working hours of ball bearing inspectors to lower fatigue and increase productivity (Locke, 1982, 19).

Likewise, time study was one of the key variables in the Hawthorne studies conducted by Elton Mayo and his associates between 1927 and 1932. Mayo, who is one of the leaders of the human relationship approach, manipulated rest pauses and duration of work of employees whose tasks "required procedural memory and visual discrimination, finger dexterity, and hand-eye and hand-hand coordination" (Homans et al., 1977, 324). They tested numerous different work patterns and concluded that there were no significant relationship between increasing output and the changes in rest pauses and shortening working hours (Homans et al., 1977, 330; Latham, 2006, 19).

Along with the world economic crisis and the increasing labor movements, especially for better working conditions and reducing working hours caused management to lose their authority and paternalistic power on employees. Organizations' and scholars' interest on human factors gradually extended and they focused on employee behavior, satisfaction, performance, and related subjects (McKinney and Howard, 1998, 160).

Two main assumptions emerged:

> [First,] there is a direct correlation between the levels of satisfaction in an organization and the level of efficiency and productivity achieved; [and the second is that] productivity is also affected by the extent to which the work and organizational structure are successful in accommodating the social needs of employees. (McKinney and Howard, 1998, 161)

Maslow's hierarchy of needs theory, Herzberg's two factor theory, Vroom's expectation theory, and others followed the human relations approach. From a general

point of view, those theories are based on the assumptions that "needs are universal, stable dimensions of people" (Latham, 2006, 56) and motivation is realized when a person's needs are met within his/her environment. For example, if the correspondence between an employee's needs and conditions at work is high, he/she is expected to perform better as their needs are satisfied (Latham, 2006, 56).

Work conditions, specifically, moderation of working hours, is one of the major subjects in this era. In Maslow's hierarchy of needs theory, moderation of working hours is essential not only for satisfaction of psychological needs (time to sleep, rest, etc.) but also for satisfaction of social needs, that is, time to develop relationships with family and social groups (Friday, 2003, 50). In their two factor motivation theory, Herzberg and his associates have categorized human needs by motivator and hygiene needs. Although they stated that hygiene factors, including work conditions, salary, status, and security are not motivators, they found those factors necessary components of a job to prevent negative employee attitudes. In other words, while motivation factors help to increase satisfaction, hygiene factors ensure reduced employee dissatisfaction (Friday, 2003, 50).

Another human relations theorist, Chris Argyris, postulated a goal conflict between organizational and personal needs. Organizations work to accomplish their goal and produce more with less cost; on the other hand, employees want to develop, to grow, and to have autonomy for themselves. If these needs match, the level of job satisfaction which leads employees' performance increases. In contrast, lack of congruence between organizational and personal goals "creates turmoil, unrest, and ineffectiveness" (Harris and Nelson, 2007, 72). Dawis, England and Lofquist theorized this relationship with a theory of work adjustment. The theory defined work adjustment process as a "suitability of the individual to the environment and of the environment for

the individual" (Pierce and Newstrom, 1980, 120). Pierce and Newstrom applied the work adjustment theory to explain the relationship between working hours and the attitudes of employees (1980, 117). They conclude that flexible working hour arrangements "can contribute to a greater correspondence between (1) an individual's abilities and the ability requirements of the job, and (2) an individual's needs and the satisfaction of those needs by the work environment" (Pierce and Newstrom, 1980, 132).

With similar assumptions, the Discrepancy Theory has been argued by many psychologists including Katzell, Locke and Lawler (Lawler, 1994, 86). The discrepancy model hypothesizes that "when employees realize desired amounts of personally important job-related outcomes, they will exhibit high levels of job satisfaction" (Morrow et al., 1994, 203). In other words, the lack of congruence between what a person believes he should receive (expectation) and his feelings of his actual outcomes, causes undesirable personnel attitudes, dissatisfaction, inequity, and low performance (Lawler 1994, 96). In respect to work scheduling, this theory was used by Morrow et.al. and Holtom et.al. to examine the impacts of employee preferences about work status (full- and part-time) on job satisfaction, commitment and schedule satisfaction. Those studies are discussed in detail below.

At the beginning of 1980s, there were several changes in work hour arrangements in the world. Organizations began to increase part-time practices, reduce working hours to create more jobs, reduce labour costs, standardize working hours, adopt more flexible systems, and implement new customer demand oriented strategies (ILO, 2005). In addition, there have been demographic changes among employees: an increased number of employees, especially number of working women, which led to concern about the quality of working life, work-family balance, changing employee needs and preferences on work schedule:

> All of these changes are reflected in a variety of working time arrangements which vary from conventional full-time, permanent, weekday work in terms of either their duration and/or timing: part-time work, flextime and "time banking" accounts in which workers can credit or debit their hours just like money in a bank, working "on call" (as and when needed), and the averaging of working time over periods of up to a year (ILO, 2005).

In this part of the study, those developments on shift working is reviewed in detail under following sections: shift work and work schedules; work schedules in policing (organizational demands and personnel demands and schedule satisfaction); and work schedules in the Turkish National Police.

2.1. Shift Work and Work Schedules

Shift work has been studied from various points of view. In general, it has been found that –to some extent—shift work influences personnel health, job satisfaction, performance, social and family relationships (ILO, 2007, 1; Vila, 2006). Also it is concluded in the literature that there is no best way to schedule working hours for all organizations (Kerin and Acacia, 2005, 205). One schedule may work for an organization or unit, while it may not work for others. Many research has been done to identify the impact of different work schedules or schedule characteristics on personnel health (Vila et.al., 2000; Hayday, et al. 2007; Smith et al., 1999; Vila et al., 2002) (circadian rhythm, fatigue, sleep disruption, stress, etc.), job related issues (job satisfaction, performance, commitment, alertness, and job accidents) (Goltz, 2006; Vila, et al. 2002; Sun, 2002) and social and family relationships (Barnett et al., 1999; Gareis et al., 2003; Gareis and Barnet, 2002). Some focused on comparison of different schedules, such as the traditional 8 hour schedule, compressed work schedules (12 hours), 10 hour work schedule, or different variations of schedules based on their effects to organizations, employees, and their families (Cunningham, 1990; Vila et al., 2002;

Smith, Hammond et al., 1998). Some were interested in different schedule characteristics such as permanent/periodical system, fast/slow rotation, forward/backward rotation, start times, and periods of shift (Tucker et.al., 2000; Vila, 2006; Axelsson, 2005; Ford, 2007).

Using any type of shift work has found advantages and disadvantages for organizations and employees. The general advantages and disadvantages of shift work, rather than any specific schedule, are discussed below. The very first advantage of implementing shift work is to meet the public demands. Critical public service providers such as police, fire departments, hospitals, and public transportation administrations that have to provide services around the clock require use of some type of shift system (McKetta, 1994, 117; RCMP, 1995, 15). Second, shift work, in general, is used "to enhance economic efficiency by matching the demand for labor with supply" (Totterdell, 2005, 43). The production process continues all day to make use of expensive equipment (Allen et al., 1999, 2). In addition to organizational requirements, some employees prefer shift work for reasons such as having quiet and less supervised working hours, getting better pay, using more daylight hours for recreation and for attending school (Totterdell, 2005, 43; Allen et al., 1999, 2).

Gärtner and Popkin describe both the advantages and disadvantages of shift work for employees and employers. They list advantages and disadvantages of shift work as follows:

Advantages for Employers:

- More intensive use of facilities and equipment via extended capital operating time.
- Increases in production to cope with higher demand or to deal with perishable goods.

- Effective operation of continuous and semi-continuous production processes.
- Optimal use of energy or other resources during the night or other slack periods.

Advantages for Employees:

- Higher total earnings where premium wages are paid for certain types of shifts (e.g. shifts involving night work).
- Longer periods of free time if paid time off is granted in lieu of shift work payments.
- May potentially save existing jobs and/or reduce precarious employment.

Disadvantages for Employers:

- Additional administrative costs resulting from having more workers (because more shifts are in operation).
- Complexity and difficulty in ensuring adequate supervision, especially at night.
- Higher labour costs due to shift premiums, provision of welfare facilities and training.
- Potential negative effects on workplace safety and health, especially where night work is involved.

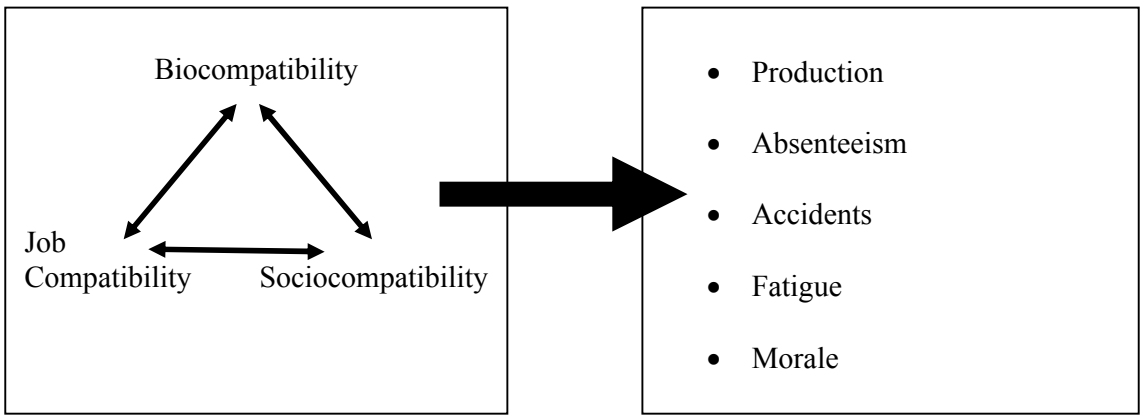
Disadvantages for Employees:

- Potential negative effects on workers' health and safety, especially where night work is involved. These potential effects include disruption of sleep, increased fatigue, cardiovascular and gastro-intestinal troubles, effects on reproductive health, increased risk of breast cancer (for women on night shifts).
- Disruption of workers' family and social life, especially due to "unsocial" and irregular hours of work.
- Difficulties in transport to and from work, especially for night workers.
- Work intensification, for example, through the suppression of breaks.

- Reduced access to training or other opportunities for workers (Gartner and Popkin, 2000).

Due to those advantages and disadvantages, "more than 10,000 schedules are in use worldwide" (Knutsson et al., 2004, 1050) to satisfy different organizational needs and employees' preferences. However, in the literature, it is widely believed that shift work creates or aggravates hazards for workers and the community. Shift work with its effects on circadian rhythms was found to increase "risk for accidents and errors;… sleepiness and fatigue…; … health problems; and disruption to family and social life" (Buxton, 2003, iii). More seriously, the mortality risk for shift workers and ex-shift workers were found 3 percent and 5 percent respectively higher than the day workers (Knutsson et al., 2004, 1050).

Figure 2. Ergonomic Considerations and Effects of Shiftwork Schedules



Source: Duchon, James C., ed. 1994. *Shiftwork: A Guide for Schedule Design*. Edited by R. H. Peters, *Improving Safety at Small Underground Mines*: US Department of Interior, Bureau of Mines, 25.

Duchon discussed some managerial considerations of changing schedules for mining companies. He developed the above presented graph to summarize the relationship between ergonomic considerations and effects of shift work. He argued that "a comprehensive assessment of any schedule…must consider each of these considerations" (Duchon, 1994, 25) including biocompatibility, job compatibility, and

sociocompatibility. Biocompatibility was defined as the ability of a schedule to conform to human physiology or circadian rhythms. Job compatibility was compatibility between organizational demands and work schedule. The third ergonomic consideration, sociocompatibility, refers to a how work schedule conform social and family life (Duchon, 1994, 25).

One of the schedules examined in this study, the 12/24 schedule, has two main characteristics: it is an extended work shifts (more than 8 hours) and causes overtime (more than 40 hours weekly). The studies on extended work shift with overtime found that those schedules are associated with high health complaints, worsening performance, and slow pace of work. For example, Lipscomb et al. studied nurses who work an extended schedule with overtime in the US. They used a one-time Nordic survey of musculoskeletal symptoms and reported that the combination of 12-hour shifts and 40 or more hours of work in a week is associated with higher risk of neck, shoulder, and back disorders than an 8 hours in a day, 5 days per week shift system (Lipscomb et al., 2002). The same results were found by Liu et al. in their two case-control studies with Japanese workers. They revealed that 61 or more hours of work per week during the previous month was associated with double the risk of acute myocardial infarction. On the other hand, some studies found different results: for example, Mitchell and Williamson indicated that workers who work a 12 hour day and night fast clockwise rotation system complained about their health less than workers who work an 8 hour, 3-shift weekly counter-clockwise rotation (Mitchell and Williamson, 2000).

From a different point of view, Hänecke et al. examined 1.2 million work injury records in Germany in 1994 and found that the risk of accidents significantly increased after the 9th hour in a 12 hour work shift. In addition, it was indicated that the risk of having accidents was higher in the evening and the night shifts than the daytime shift

(Hanecke et al., 1998). Smith et al. compared schedules that had different lengths of shifts (8 and 12 hours) using the Standard Shiftwork Index questionnaire. They found no significant relationships between different shift lengths, but they indicated differences among the alternative 12 hour work schedule regarding their flexibility. The findings showed that, among police officers in England, those who worked the flexible 12 hour shift experienced more satisfaction, and better sleep and alertness levels than those who worked in a rigid 12 hour system with an earlier start to the morning shift (Smith et al., 1998).

Knauth, in his study based on 105 articles on work schedules between 1970 and 2005, listed the potential negative and positive effects of extended hours. The potential negative effects are adverse effects on health and performance, the reduction of alertness, increasing absenteeism, toxic exposure, sleepiness, fatigue, accidents on and off the job, communication problems with managers, and problems while driving home; the potential positive effects of extended working hours are having more time with family, social activities and domestic duties, higher satisfaction with working hours, less overtime and shift handover, and less travel time and cost (Knauth, 2007, 126).

2.2. Work Schedules in Policing

All police agencies face three crucial issues: "citizen safety, cost of operations, and officer morale" (Taylor and Huxley, 1989, 5). A well-designed work schedule contributes to citizen safety by increasing the effectiveness of services; decreases cost of operations by minimizing surpluses and shortages of employees; and maintains officer morale by balancing work and personal needs (Stenzel and Buren, 1983, 121; Taylor and Huxley, 1989, 5; The Home Office UK Police, 2004, 59).

This section of the study investigates nationwide studies conducted to examine schedule practices in police departments in the USA, Canada, and England. The first

one was prepared by Stenzel and Buren as a report for the National Institute of Justice, U.S. Department of Justice in 1983 (Stenzel and Buren, 1983). In this report, the scheduling practices of 160 police agencies were examined based on management, patrol operation, and employee-related issues. The data were collected from department reports, a mail survey, 40 personnel interviews and an extensive literature review.

The researchers used indicators to measure the effectiveness of a schedule in meeting management's demands, officer's preferences and the compatibility of the environment. The list of indicators used in this report includes:

Table 1. Indicators of an Effective Schedule Developed by Stenzel and Buren

Management Ability to Meet Department Goals	**Officer Needs and Morale**	**Agency Operating Environment**
• Manpower availability to cover workload demands • Patrol division output • Operational expenses • Overtime accrual • Vehicle use and maintenance • Operational communications • Training time and costs • Hidden costs for others • Equipment use and maintenance	• Unnecessary stress and fatigue • Sick leave taken • Injury on duty • Vehicle accident • Impact on family and personal activities • Management relationship with the employee associations • Participatory scheduling	• Larger government body • Community expectations and needs • Law enforcement system • Public service system • Contractual or legal system

Source: Stenzel, William W, and R Micheael Buren. 1983. *Police Work Schedule: Management Issues and Practices:* The National Institute of Justice, 134.

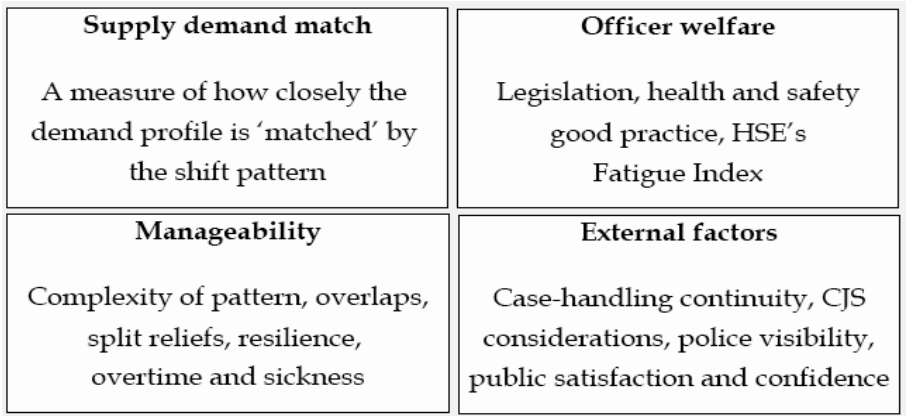
As a result of this report, researchers provided discussion on the key administrative factors of schedules; comparisons of different types of schedule practices; recommendations for designing effective work schedules; and the indicators that determine the most efficient schedules for each agency (Stenzel and Buren, 1983, 58-134).

The second country-wide study on police work schedules was done by the Royal Canadian Mounted Police (RCMP, 1995). The report was prepared by the research

section of the RCMP "to provide basic information and recommendations that will assist in the task of understanding and balancing …[the] diverse competing interests" (RCMP, 1995, 1) of organization and employees. The study took two years to complete and consisted of "332 police officer interviews, 124 spousal interviews, 1,472 alertness tests, 708 stress/ burnout tests, [and] 580 citizen interviews"(RCMP, 1995, 2). As a result of the findings, the following recommendations were made: equal personnel allocation to each hour of the day should be abandoned; rotational shifts harm officers' health and fixed shifts arrangements should be used to replace the rotational shift; police officers should be trained to cope with the effects of shift work; there is no one shift pattern that pleases every officer; managing schedule flexibility is difficult with longer shifts (12 and 10 hour shifts); 10 and 12 hour shifts provide less overtime payment than other systems; officers over the age of 45 should have the option of not working extended hours; duty cycles should be less than 48 hours and the rest period between shifts should be a minimum of 12 hours (RCMP, 1995, 16-17).

The third study was conducted in England and Wales police departments. The purpose of the study was to investigate the current work schedules, to explore best practices, and to identify barriers and requirements for the more efficient deployment and schedule arrangements. Also, flexible working practices were analyzed and recommendations were provided (The Home Office UK Police, 2004, 3). The study was conducted in seven police stations selected from a mix of rural/metropolitan and large/small stations. To analyze and to clarify schedules and their strengths, weaknesses, challenges, and threats in detail, the following balance scorecard framework was used:

Figure 3. Work Schedule Balance Scorecard



Source: The Home Office UK Police. 2004. *Study of Police Resource Management and Rostering Arrangements.* London, 10.

Supply-demand match was defined as congruence between the way shift patterns distribute resources and the pattern of demand efficiently. It was believed that "a good supply-demand match can potentially lead to improved speed and quality of response, improved crime investigation, reduced anti-social behavior and improved customer satisfaction" (The Home Office UK Police, 2004, 10). In this report, supply data was collected from "current shift patterns, consisting of start times, shift lengths and rest day patterns" and the demand "was measured by the volume of "calls for response" from the public by hour of the day and day of the week" (The Home Office UK Police, 2004, 11).

The effect of schedules on officer welfare was measured as the compliance between schedule and police regulations and the European Working Time Directive (WTD). Officer welfare was used as a critical factor of measurement as it "can potentially improve officer safety, increase morale, provide healthier, less fatigued officers and reduce sickness levels" (The Home Office UK Police, 2004, 10).

Manageability of schedule was used to understand the ease of work schedule arrangement and implementation. It included the complexity of the pattern and other characteristics of the schedule, officer satisfaction and the impact on job related

attitudes such as absenteeism and overtime. External factors were also taken into account to compare the schedules. “Case handling continuity, availability for court and impact on other [criminal justice service] agencies, as well as the impact on the public, both in terms of officer visibility and continuity of care for victims and witnesses” (The Home Office UK Police, 2004, 11) were used as the external factors.

In the literature, the relationships between work schedules and work satisfaction, commitment and attitudes have been frequently studied. Vila argued that police agencies should apply some kind of flexible work schedules and staffing approach to “do a better job of meeting both demands for service and the needs of officers and their families” (Vila, 2006, 978). In his article, Vila’s purpose was to understand the relationship between long shift work and police officers’ performance, health, and safety by examining three preliminary studies. The first study was conducted among Philadelphia police officers by Charles E. Czeisler and his colleagues between 1984 and 1988. They conducted a pre/post test study among line level officers, with 177 in the experimental group and 198 in the control group, using self-report questionnaires. In the first part of the study, they found a significant effect on officers’ performance and safety. Then they developed a work schedule that was a clockwise-rotated a 4-day, 8.5 hour schedule by considering “the results of officer self-reports and evaluating staffing requirements based on official records of demand for police services by time of day” (Vila 2006, 974). The developed schedule that was “more consistent with circadian factors, officer preferences, and staffing demands” was applied to the police stations. After eleven months, the same questionnaire was used to compare schedules. The results indicated “strong improvements in sleep quality, alertness, health, safety, and accidents among the treatment group compared to the control group” (Vila, 2006, 974).

Moreover, the accident rate with motor vehicles in the treatment stations decreased 40 percent within a 2 year period.

The second study was the "Tired Cops Study" conducted by Vila in 1996. He collected data from 4 medium-sized police departments for 4 to 6 months to identify "the prevalence and consequences of excess work-hour-related fatigue among patrol officers" (Vila, 2006, 975). He administrated the Pittsburgh Sleep Quality Index questionnaire to 379 police officers. Also he measured officers' fatigue by a computerized eye-reaction measurement device. He conducted interviews and focus groups with officers and their families. The results revealed that officers have very poor quality sleep that causes health problems more than the average general public.

> [One in five officers' impairment level was] equal to or greater than that associated with a blood alcohol concentration (BAC) of 0.05% (the legal limit in most US states for drunken driving is 0.08 %). In 339 [out of 5,274 tests], the officers showed impairment equivalent to a BAC of 0.10 % [which] is six times higher than that usually found among shift workers at heavy industry plants…(Vila, 2006, 975).

The third study is about critical incident exposure and sleep quality in the San Francisco and New York police departments. Neylan et.al.used the Pittsburgh Sleep Quality Index questionnaire to find out the impact of police work on sleep and job stress. The results showed that both variable shifts and stable day shifts negatively affect sleep quality (Vila, 2006, 975).

As a result, Vila concluded that the findings of the three studies were consistent with his observations and interviews as well as with the studies conducted by other departments. He supported his idea with the data collected by the Federal Bureau of Investigation on the number of the Law Enforcement Officers Killed or Assaulted. He argued that the increase in accidental deaths alongside the decline in felonious killings

can be explained or "may well be related to shift work and long work-hour practices" (Vila, 2006, 976).

2.2.1. Organizational Demands

An optimal work schedule for any organization should balance operational requirements and employee preferences. This part of the study discusses organizational demands including legal demands (national and international), efficiency, flexibility, and manageability.

2.2.1.1. Legality

The first legal regulation was introduced in England in the Factory Act, 1833. Today, "almost all countries" (Lee, 2004, 52) have established regulatory interventions on working hours. Legal regulations are prominent factors that need to be considered before setting a schedule for any organization (Stenzel and Buren, 1983, 81). Stenzel and Buren stated that "regardless of the method used to find scheduling alternatives, [designing a schedule]… can often be facilitated by … identify what kinds of schedules and properties are needed to comply with department policies" (Stenzel and Buren, 1983, 83). Therefore, in this study, it is assumed that a schedule needs to comply with legal regulations. Legal requirements are discussed based on national policies including the Constitution, Laws, regulations, directives and circulars and the standards that are recognized by international organizations.

This independent variable, the legality of schedules were examined based on national laws, regulations, directives and international standards, including those of the ILO, the EU, and other police agencies' standards and regulations.

National Regulations

Each police agency has its own unique resources and demand potential, therefore, each nation establishes their own rules to standardize working time

arrangements and to protect employees (Police Standards Unit, 2005, 10). In the Turkish Constitution, it is arranged "to raise the standard of living of workers, and to protect workers … in order to improve the general conditions of labour…" (The TGNA, 1982, Article 49/2). In Article 50/3, rest and leisure time are recognized as the rights of all workers and the "rights and conditions relating to paid weekends and holidays, together with paid annual leave" (The TGNA, 1982, Article 50/3) are required to be regulated by law.

As entailed by the Constitution, the rights of government officers' working hours, like all personnel related issues, are arranged by the GOA, no. 657. Article 99 of the GOA limits government officers to work more than 40 hours in a week (GOA, 1965, Article.99). On the other hand, the Act makes an exception for agencies that have to serve the public 24 hours a day, allowing such agencies to conduct different schedules based on demand. These agencies, including police departments, fire departments, and hospitals, can extend working hours beyond 40 hours, but new schedules must be approved by the Office of Personnel Management, should be arranged by a regulation or a by-law (GOA, 1965, Article.101), and the overtime needs to be paid (GOA, 1965, Article 178).

Based on the GOA, the WTC was signed by the Minister of Interior, Nahit Mentese in 1995 to standardize work schedule practices in the TNP. Before the Circular, DOP's had arranged their working systems by their needs and human resources capabilities. This process caused many personnel complaints, dissatisfaction, and low performance among officers. To eliminate those impacts of work schedules on the job, the WTC requires DOP's to implement either recommended work schedules or to create schedules with conditions that satisfy organizational demands, citizen expectations and personnel preferences (Ibid.).

In Article 4 of this Circular, three types of working schedules are recommended for DOP's: 12/24, 12/36, and 12/12. The first numbers refer to working hours and the second numbers refer to the hours of rest after shifts (Appendix A). The first schedule consists of three groups and the second one has four groups. They are recommended during normal working conditions. The last schedule, the 12/12 schedule makes more officers available to work by dividing manpower into two groups. It is recommended for using in "extreme situations." In Article 3, an "extreme situation" is defined as a situation that police departments have difficulty to handle and require additional manpower from neighbor provinces or military force to support (Ibid., Article 3).

Other essential provisions of the WTC are as follows: (1) Bureau officers work within normal working hours (Monday through Friday between 8am and 5pm, with 1 or 2 days off in a week) as other government officers, unless an extreme situation occurs. In an extreme situation, their working hours can be rearranged and their off days can be delayed (Ibid., Article 4-5); (2) working hours of shift officers cannot be extended except in extreme situations, and supervisors can delay changing shifts no more than ¼ of a shift length, which is 3 hours for a 12 hours shift; (3) DOP's can use different schedules other than the recommended ones. But those schedules are required to be "less" than 40 hours and "more" than 56 hours in a week and need Governor Approval. In addition, the schedules of the Headquarters' units must require to be approved by the General Director of the TNP (Ibid., Article 4/1).

In the WTC, the Ministry of Interior and the General Directorate of the TNP are two major actors who are responsible for shaping working hour policy and the general structure of work schedules (Ibid., Article 4/1). The chief of DOP's and the chiefs of the patrol units, as well as the officers, are responsible for implementing the working hour policy. The chiefs of police are expected to select the best schedules for their needs

other than recommended schedules to satisfy organizational demands, citizen expectations and personnel preferences.

International Standards

Besides the national regulations, as a member of the United Nations (UN) and a candidate for full membership of the European Union (EU), Turkey is required to consider international standards on working hours. In fact, Turkey recognized this requirement by signing the Universal Declaration of Human Rights (UDHR) in 1948. In Article 24 of this UN declaration, it was accepted that "everyone has the right to rest and leisure, including reasonable limitation of working hours and periodic holidays with pay" (*UDHR,* 1948, Article 24).

The debates, interventions, and trends on working hours have changed over time based on economic, social and political changes in the world since the introduction of the Factory Act (1833) in England (Lee, 2004, 31). Specifically, after the First World War, several legislative arrangements were introduced. The main focus of these regulations was to establish restrictions on the length of working hours. There are three main reasons to set restrictions on working hours: (1) to protect employees from the negative effects of long working hours, (2) to standardize working hours for all employees in different levels of organizations, (3) to eliminate the abuse of employees by employers using working hours as a tool of competitiveness (Lee, 2004, 32).

In addition to ILO and EU standards on working hours, more specific, applications of some police departments around the world on working hours are discussed in this part of the study.

ILO Standards

The International Labour Organization (ILO), which is a specialized UN agency, was founded in 1919 to formulate "international labour standards in the form of Conventions and Recommendations setting minimum standards of basic labour rights" (ILO, 2008). The ILO is one of the major organizations dealing with working conditions in the world. In the first Convention (Hours of Work Convention No. 1) of 1919, the ILO established "a maximum standard working time of 48 hours per week and eight hours per day as an international norm" (ILO 2008) From this first Convention to the revision in 2004, 16 Conventions and 11 Recommendations have been adopted as ILO standards on hours of work (ILO, 2008, 5). Although Turkey has not ratified these arrangements on hours of work, ILO standards are used to examine current work schedules since they are internationally recognized standards.

The international standards on work time arrangements developed by the ILO are as follows:

1. Weekly Limits

The ILO's standards on working hours were initiated with its first convention in 1919, the Hours of Work Convention, No.1, and developed in the Hours of Work Convention, 1930 (No. 30), by setting a standard of 48 hours per week including overtime. The Forty-Hour Week Convention, 1935 (No. 47), and the Reduction of Hours of Work Recommendation, 1962 (No. 116) identify "the promotion of a 40-hour week as a standard to be realized, progressively if necessary, by ILO member States" (McCann, 2005, 13).

In 2008, an ILO report based on the Conditions of Work and Employment Program was prepared to provide an overview of 109 national legal regulations, including Turkey's (Evain 2008). Among these national provisions, a 40-hour weekly

limit is used by more than 40 percent of the countries. Six of the 109 countries, however, do not have a weekly hours limit at the national level.[2] Turkey was reported as having a 45-hour limit in the Turkish Labor Law. Also, some European countries[3] "have no limit on normal hours, instead adopting a 48-hour maximum limit on total working hours, including overtime" (Evain, 2008, 9).

2. Daily Limits

In Conventions No.1 and No.30, the normal daily limit was set at 8 hours. Almost 65 percent of the countries mentioned in the ILO report have enacted and provided an 8 hour daily normal hour limit (McCann, 2005, 11). In some countries, there are arrangements to extend daily hour limits under certain conditions, such as limiting weekly hours or granting extra day(s) off. For example, in Germany, workers are allowed to have 5 hours overtime once in a 2-week period. In Malaysia, an 8 hour limit can be extended one hour as long as a 48 hour weekly limit is observed (McCann, 2005, 11).

3. Overtime Limits

Legislative overtime limits were established with the same concerns as those on normal hours, such as ensuring the health and safety of workers. In the aforementioned ILO conventions and recommendations, normal working hours are limited but overtime is addressed as an exception in response to urgent circumstances that "must be reasonable and in line with the goals of the standards" (McCann, 2005, 15). Therefore, ILO members are required to set some kind of overtime limits but no limit is mentioned in the ILO standards (McCann, 2005, 13).

2 Australia (the limit is 38 hours "and reasonable additional hours"), India, Jamaica, Nigeria, Pakistan and Seychelles

3 Denmark, Germany, Ireland, Malta and the United Kingdom

At the national level, most of the countries have a maximum limit on weekly hours to limit overtime work from 48 to 60 hours. Also different methods of national limitations are in force:

- placing direct limits on overtime hours (usually on a daily, weekly or annual basis, or as a combination of these);
- limiting total working hours; or
- specifying minimum daily rest periods (Evain, 2008, 11).

The most prominent daily working limits are 10 or 11 hours per day including overtime in the world, although in Europe, the 13-hour maximum limit is the most common. On the other hand, some countries have regulations to prohibit certain groups of workers (pregnant women, mothers of young children, disabled workers, students, etc.) from performing overtime and some countries accept the rights of employees to refuse to work overtime (McCann 2005, 15).

4. Overtime Compensation

Overtime compensation is generally arranged in two ways, as a payment at an increased rate above the ordinary wage or as a compensatory rest time equivalent to the hours worked. Overtime work is required to be remunerated at a rate not less than 25 percent more than the ordinary salary as an ILO standard. At the national level, most of the countries have some kind of provisions that entitle employees to have overtime compensation with a 50 percent premium rate. Most of the industrialized countries are "more likely to permit overtime rates to be determined by collective bargaining or individual employers" (McCann, 2005, 16-17).

5. Night Work

In 1990, the ILO organized a convention on night work and released the Night Work Recommendations. While night work is defined as "all work which is performed during a period of not less than seven consecutive hours, including the interval from midnight to 5 a.m." (ILO 1990 , Paragraph 1(a)), it is recommended that normal hours of night work not exceed 8 hours in any 24-hour period (ILO, 1990 , Paragraph 4(1)). Also the same Recommendation, paragraph 8(1), proposes a rise in financial compensation to night workers (ILO, 1990 , Paragraph 8(1)).

6. Rest Period Limits

Rest period limits can be arranged by providing: rest breaks during the working day, rest time between shifts, and weekly rest "to allow workers to spend time with family, friends, in religious observance and with the community as a whole" (McCann 2005, 33). As an international standard, the ILO mandates only a weekly rest limit that requires at least a 24 hour uninterrupted rest for public or private workers by Convention No.14 and No.106 (ILO, 2005; McCann, 2005, 33).

At the national level, most of the countries have rest periods during the working day ranging from 10 minutes to 2 hours. A 30 minutes rest period is found as the most common approach within this range (McCann, 2005, 34). There are regulations on working hours that entitle minimum daily rest periods between consecutive shifts. Although some countries require 9, 10, or 12 hours daily rest, including those that observed the European Working Time Directive, 11 and 12 hours are set as minimum daily rest hours. Almost all countries provide a weekly rest period for employees and the majority of them require a rest period of one day in length (McCann, 2005, 38).

7. Annual Holidays

In the above mentioned Conventions and Recommendations and in other documents, the ILO standardizes a period of annual paid holidays of at least 3 weeks (ILO, 2005, 6). This provision has two main objectives: the first one is to "ensur[e] sufficient rest and recreation opportunities throughout the year, to preserve the health of workers and ensure that they remain able to perform their jobs" (McCann 2005, 43); the second objective of regulating a period of annual holiday is to "facilitat[e] work/life balance, by allowing workers to devote uninterrupted periods of time to their families and recreational activities" (McCann, 2005, 43). At the national level, almost all states[4] have some kind of annual leave period. Most of them mandate 24 to 26 days off, almost one-third of them mandate 10 to 15 days off, and less than 20 percent of them mandate 18 to 22 days (McCann, 2005).

In summary, the ILO international standards on working hours are established to protect the health and safety of workers. These standards, however, are sometimes criticized as being behind the times, they are still widely recognized minimum standards. ILO standards on working hours can be summarized as follows: limit of 8 hours working time a day and 40 hours a week, no overtime limit but requiring national regulation of overtime, remuneration of overtime at a rate not less than 25 percent more than the ordinary salary, at least a 24-hour uninterrupted weekly rest period, and a period of annual paid holidays for at least 3 weeks.

European Union Standards

The second important international set of standards for working hours is the EU. Turkey was officially accepted as a candidate for full membership to the EU in December 1999, at the Helsinki summit of the European Council and accession

4 In the report, only Australia and the United States are mentioned that they have no national limits on annual holidays.

negotiations opened in October 2005 (The Commission of the European Communities 2008). The accession negotiations phase still continues with the EU assessments of Turkey's progress on all related issues. Especially during the last decade, Turkey has struggled with the integration process of EU standards (The Commission of the European Communities 2008). As "one of the most important areas of employment" (The Council of the European Union, 1993), working hours were also arranged by an EU directive. The EU Council signed the Working Time Directive (93/104/EC) in November 1993 to protect public and private employees (The Council of the European Union, 1993, Article 3).

The purpose of the Directive is defined as setting "minimum safety and health requirements for the organization of working time" (The Council of the European Union, 1993, Article 1). The core provisions of the Directive are: (a) the daily minimum rest period is 11 hours per 24 hour period (Article 3); (b) if daily working duration is longer than 6 hours, employees need to have a rest break time (Article 4); (c) the weekly minimum uninterrupted rest period is 24 hours (Article 5); (d) the average weekly working hours including overtime is at maximum 48 hours (Article 6); (e) a minimum paid annual leave is 4 weeks per year (Article 7); (f) night shifts should not exceed 8 hours in any 24 hour period (Article 8) (The Council of the European Union, 1993).

Police Departments' Practices

Among police agencies around the world, there are no internationally developed standards on working hours and scheduling, but there are similarities in terms of scheduling implementations due to the shared characteristics of police tasks, environments, and resources. Police agencies provide services on a 24-hour basis within "highly unstructured, unpredictable environments" (Ford, 2007, 22). In general, police agencies need to assign resources adequately to match the demand for police services

during each hour of the week (Taylor and Huxley, 1989, 5). Traditionally, police agencies have implemented "a rotating, eight-hour system of day, evening, and [night] shifts" (Cunningham, 1990, 185) in most of the western countries.[5] This schedule has a 40-hour weekly limit and equal numbers of officers are assigned at all times (The Home Office UK Police 2007, 5). In the mid-1970's, the compressed work week (CWW), 12 hour shift schedule practices, emerged. Different variations of CWW have been used including: four consecutive shifts followed by three or four days off; two day and two night shifts followed by four days off (Cunningham, 1990, 185).

After the 80's, as a result of changes in community demographics, forms of crime, social habits, legislative regulations, and increasing demands for new services, police agencies needed to adapt their staffing policies and scheduling procedures. Different scheduling arrangements have emerged to respond to those developments. Flexible working schedules enable agencies to meet the demand for police services that vary during a day, week, or year (The Home Office UK Police, 2007, 5). Moreover, differences among police departments have caused agencies to set different schedules and flexible working hours (Ernst et al., 2004, 21).

In the United States, working conditions including the limits of daily and weekly working hours, overtime, and annual leave were arranged in the Fair Labor Standards Act (FLSA) in 1938. The Act, with the amendments in 1985, covers state and local public employees. The provisions on fire protection and law enforcement employees were arranged under Regulation 553 Subpart C. The regulation requires police officers to "receive at least the minimum wage and may not be employed for more than 40 hours in a week without receiving at least one and one-half times their regular rates of pay for the overtime hours" (U.S. Department of Labor, July 2008). There is no limit in the Act

5 In the TNP, officers have worked traditionally 12 hours morning and night shifts with a total 56 working hours in a week (12/24 system).

for overtime hours for those aged 16 and over. It requires officers to have short rest periods between 5 to 20 minutes long that must be counted as working hours; on the other hand, rests for meals (30 minutes and more) are generally not accepted as compensated work time. Also, the Act does not require employers to pay extra money for night shifts or working during weekends but leaves the matter to the agreement between employee and employer (U.S. Department of Labor, July 2008).

Vila argued that police officers work a large number of overtime hours because police agencies do not have standards and regulations on working hours like airline pilots and truck drivers. He presented the Boston Police Department as an example. In August 2005, 85 Boston police officers were found in violation of weekly working limits by 96 hours collectively. Consequently, he concluded that long working hours cause fatigue, and tired police officers suffer from a variety of disorders. Furthermore, they can become harm for public safety (Vila et.al., 2000; Vila, 2006).

Among the numerous types of work schedules in use by US police agencies, the most common ones are: the 8-5 plan, with 5 days of 8 hours work and 2 days off; the 10-4 plan, with 4 days of 10 hours work and 3 days off; the 12 CWW, with 3 days of 12 hour shifts and 4 days off then 4 days of 12 hours work and 3 days off (TELEMASP Bulletin, 1995); and flexible work schedules. Vila, however, argued that flexible work schedules, which allow employees to determine their own schedule, including the start and ending time of any shifts within the limits of the agency (The Office of Personnel Management), enable police agencies to "do a better job of meeting both demands for services and the needs of officers and their families" (Vila 2006, 978). A study done by the Police Foundation in 2005 revealed that "the most prevalent shift length was the traditional, 8-hour shift (40.1%)…[while] for the larger agencies, the 10-hour shift was most common (35%)"(Amendola et al., 2005, 1). Also, it was found that 12-hour shifts

becoming more and more attractive among police agencies in the USA (Amendola et al., 2005, 2).

Another police agency that conducted a large body of studies on work schedules, the English Police, arranged working hours in the Police Health and Safety Regulations 1999, based on the Health and Safety at Work Act 1974 and the European Union WTD, 1998 (The Home Office UK Police, 2004, 27). The regulations require police agencies to "provide a working environment that has due regard to the health, safety and welfare of its officers and staff"(The Home Office UK Police, 2007, 19). In England, police work schedule practices vary from department to department. The most implemented ones were summarized in the report prepared for the Home Office of the England police as follows;

- **Eight-hour pattern** - three eight-hour shifts cover the 24 hours in a day with fixed start and end times and no overlaps. Operated on a four or five week cycle, the number of consecutive shifts and rest days can vary.
- **12-hour pattern –** two 12-hour shifts cover the 24 hours in a day with fixed start and end times and no overlaps. Usually operated on a four or eight week cycle, the pattern runs as either two days, two nights or blocks of four consecutive shifts, followed by four rest days.
- **Ottawa –** a shift pattern of varied shift lengths, providing some overlaps, which incorporates seven night shifts in a row. Traditionally operated on a five-week cycle. Extended shift lengths were introduced to increase the number of rest days.
- **2x2x2 –** usually operated on a ten-week cycle, the pattern runs as two

earlies, two lates, two nights and four days off. Overlap times can vary across the week.

• **VSA –** a pattern where shifts lengths vary (eight, nine and ten hours). Start and end times also vary, providing greater flexibility for overlaps. Traditionally operated over five weeks, however recent advances have seen this period of rotation extended (The Home Office UK Police 2004, 18).

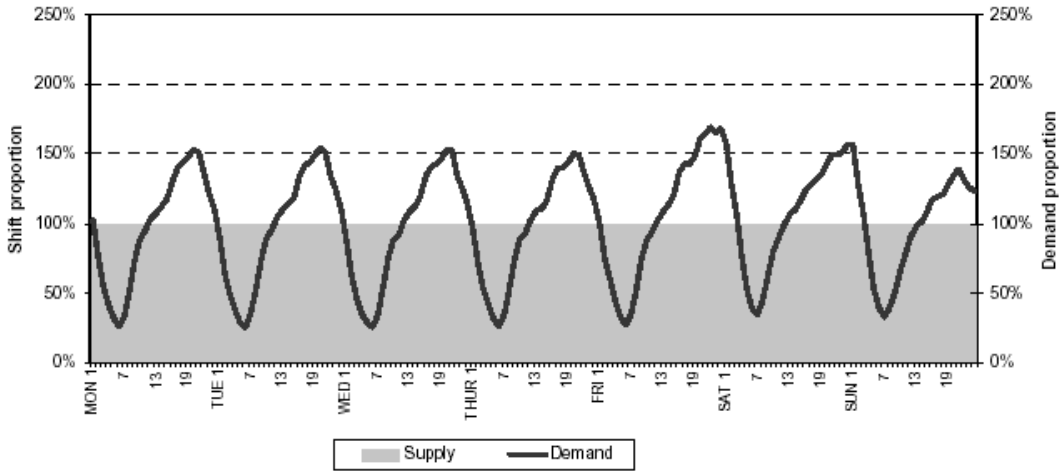
Some of these schedules do not comply with the European Union WTD by exceeding the 8-hour daily and night limits and by using quick rotation with fewer rests than 11 hours between shifts. Among the above mentioned schedules, the VSA's were observed as (1) the best supply-demand match, (2) the lowest fatigue score, (3) maximum officer welfare considerations, (4) more rest days for officers (The Home Office UK Police, 2004, 4).

2.2.1.2. Efficiency

Police agencies implement some types of schedules to respond to expected service demands. The essential challenge is to achieve a better match between supply and demand (The Home Office UK Police, 2004, 25). The efficiency of a schedule is described as "the closer the [supply-demand] match, the more effective the shift pattern" (The Home Office UK Police 2004, 25). In the literature, the level of supply-demand match is examined by comparing supply and demand curves to find out the under- and over-staffing levels. The supply curve is set to provide the average number of officers assigned to each hour of the day and day of the week in a schedule. The demand curve is generated by calculating the average hourly demand data for each hour of the day and day of the week. The comparison of the supply and demand curves is completed by inputting the supply and demand data into a chart to determine the under- and over-staffing for each hour of the day and day of the week. For example, a supply-

demand chart with equal staffing and weekly demands curve is presented in figure 4. It is clear from the graph that equal staffing causes both under-staffing where the demand curve is above the supply line and over-staffing where the demand curve is below the supply line (The Home Office UK Police, 2004, 25).

Figure 4. Example Supply-Demand Chart



Source: The Home Office UK Police. 2004. *Study of Police Resource Management and Rostering Arrangements*. London, 34.

This type of chart has been used frequently to measure the productivity of work schedules among police agencies over the past few decades. In general, police service demands have been calculated based on calls for service. Although the absolute level of calls for service, police service demands, can be different between police departments and between rural and urban areas, demand for each hour of the day was found distributed in almost the same pattern for each area (Taylor and Huxley, 1989, 5-6; Logie; The Home Office UK Police, 2004, 3). From those findings, the generalizable dimensions of the police service demands can be listed as follows:

a- Police service demands change throughout the days of the week and hour of the day.

b- The peak police service demand times are between 5/6pm and 9/10pm on

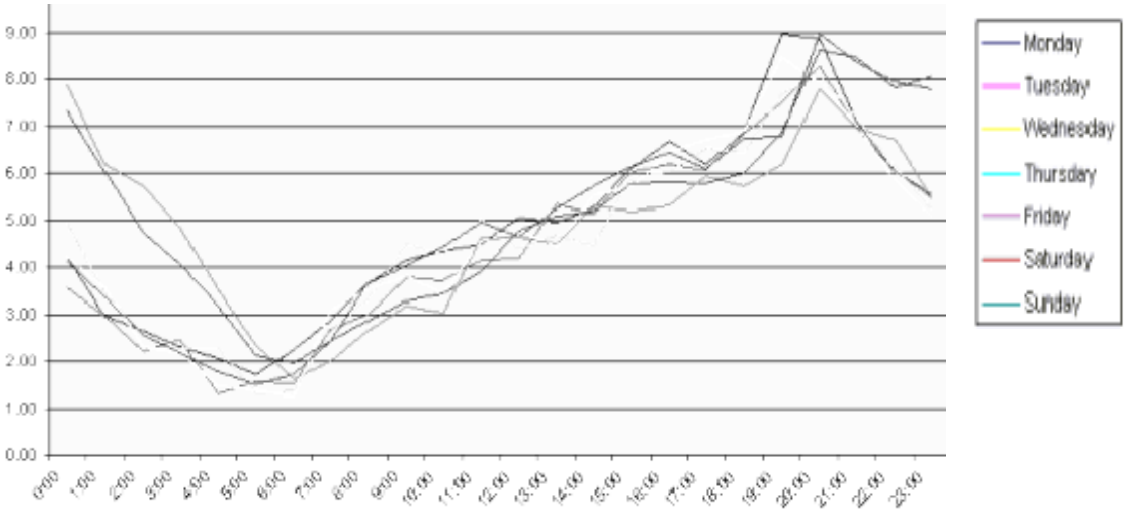
weekdays and a high volume of demand expands and occurs between 9pm and 1am on weekends.

c- The lowest level of service demand occurs between about 4am and 7am on weekdays and 5am and 7am on weekends (The Home Office UK Police, 2004, 15).

d- Service demands on Saturday and Sunday mornings between midnight and 4 am are double those of the same time period on weekdays.

These general dimensions of police service demands are presented in figure 5.

Figure 5. Average Demand Profile per Hour of Each Day



Source: Logie, Bruce. *Police - Shift Work Guide: Demand Profile*, Last updated on 24 February 2009 Available from http://web.ukonline.co.uk/bjlogie/demand.htm (accessed 03.10.2009.

In some studies (Taylor and Huxley, 1989; The Home Office UK Police, 2004), a call for service grading system was used to better understand the police service demand. In the TNP, there is no computerized event loc in departments. Therefore, the researcher cannot get sufficient data on call for service and crime. Besides having no accurate record of calls for service, there is no such grading scale to classify the calls based on type of crime. Also, since calls for services is not used to determine workload distribution in the TNP, data on crime rates and time of crimes in 2008 are collected

from the Izmir DOP in order to determine service demands and to establish a demand curve for each region.

2.2.1.3.Flexibility

Schedule flexibility refers to meeting variable police demand by flexible deployment throughout the day, the week, and the year. Traditionally, police agencies provide services with the same number of officers on a rotating shift pattern. Today, agencies have begun to use various methods to make schedules more flexible and to meet the variable police service demand effectively (The Home Office UK Police, 2007). With cultural, historical, socio-economic, and other differences, various flexible work approaches developed among countries, industries, and companies. Some approaches are part-time work, self-determination of start and end times, fixed shifts, working from home, and variable shift arrangements (VSA) (Costa et.al., 2004, 835).

Flexibility of work schedules provides benefits both for employees and employers. Flexible schedules help employees to increase their health, satisfaction and commitment to organization, to meet their individual needs such as childcare, disabled family members, control of their leisure time. Flexible schedules help management to increase affectivity and decrease burnout, turnover, and absenteeism level (The Home Office UK Police, 2007).

In this study, schedule flexibility examined based on organizational and personnel flexibility. Organization based flexibility, "meet[ing] the needs of employers, e.g., changing operational times, varying customer and service times" (Costa, 2004, 834), was measured by comparing the fit level between days of the week/seasons and number of officers. To measure organizational based flexibility, the number of officers scheduled to work in a given schedule was investigated to determine whether it was correlated with variable demand depending on hour of the day, day of the week and

season. Organizational demand that changed based on hour of the day, weekly and seasonal demand change was discussed.

Individual based flexibility of schedule, "meet[ing] the changing needs of employees in different phases of life (e.g., studies, family, aging)" (Costa, 2004, 834), was measured by three survey questions that used a 5 item-Likert scale: " The current work schedule affects my family life negatively," "The current work schedule makes it easy for me to coordinate my schedule with schedules of other family members," and "The current work schedule affects my social life negatively." Individual flexibility provides employees more autonomy to control over working hours in terms of starting and ending times, breaks, days off, vacations, and "the amount of working hours in different periods of one's working life (e.g., part-time work, bank of hours) can also meet the needs of employees" (Costa, 2004, 834)

2.2.1.4. Manageability

Manageability refers to the ease of arranging shift patterns. In this study, the factors that the London Home Office used to measure manageability of a schedule were replicated. Those factors, including number of shifts, start and end times, length, rotation, and flexibility (RCMP, 1995, 29), helped the researcher to compare work schedules in terms of manageability.

Table 2. Shift Pattern Complexity Factors

Characteristic	Examples of simple patterns	Examples of complex patterns
Number of shifts	Two shifts, early and late, e.g. 12-hour shift	Any number of different shifts, with use of specialist shifts for differing days of the week, e.g. flexible VSA
Start time	Standard start time for each shift, e.g. any fixed shift	Differing start times for the same categorisation of shift i.e. early, late night, e.g. VSA
Length	One shift length repeated for all shifts, e.g. eight and 12-hour shifts	Any number of differing shift lengths, dependent on time of day, day of week, week of year, e.g. VSA
Rotation	A four week rotation is the minimum that will comply with regulations	Any length of rotation period, maximum observed during study is 40 weeks, e.g. 2x2x2
Flexibility	All factors outlined above are inflexible other than through use of overtime, e.g. all fixed shifts	Flexibility over start time, shift length can be agreed to be flexible within certain constraints, e.g. VSA

Source: RCMP, Royal Canadian Mounted Police. 1995. *Shift Pattern Study: An Analysis of the 9, 10, and 12 Hour Shifts in the RCMP within British Columbia*. Vancouver, BC.: 'E' Division Operations, Research Section, p.29.

Manageable schedules facilitate arranging working times and help management. In the above table, examples of simple and complex patterns of work schedule characteristics are presented. Only the "Start Time" factor was changed to "Start and End Time" for this study. By using these factors, two schedules used by uniform patrols and peace teams were compared to determine their manageability characteristics.

2.2.2. Personnel Demands and Schedule Satisfaction

Changing any characteristics of schedule including the length of the shift, type of rotation, the average hours of work in a week, the number of consecutive night shifts, or the frequency of weekend's work have major impact on workers' health and family life and are "not always greeted with open anticipation" (Freesmeyer and Stenzel, 2008, 34). One of the essential factors of developing work schedule, employee preferences are shaped by spouses' work conditions, childcare requirements, health, social activities, "off duty jobs, contract overtime opportunities, and continuing education plans" (Freesmeyer and Stenzel, 2008, 34). It is widely recognized that meeting worker's demands "can potentially improve officer safety, increase morale, provide healthier, less fatigued officers and reduce sickness levels" (The Home Office UK Police, 2004, 10).

One of the leading study conducted by Morrow, Elroy, and Elliott examined the relationships between employees' preferences and job satisfaction, commitment, and scheduling satisfaction of nurses (Morrow et al., 1994, 207). Morrow et.al. administered a survey with 272 full- and part-time nurses in a large hospital. They used the Job Descriptive Index –developed by Smith et.al.– to assess job satisfaction, the Organizational Commitment Questionnaire to measure nurses' job commitment, a 5-item schedule satisfaction scale (Cronbach's α= .84) developed by the researchers, and some other items to identify preferences of status, schedule, and shift. They conducted multiple analysis of variances (MANOVA) and one-way analysis of variance (ANOVA) to evaluate the data (Morrow et al., 1994). The findings of this study revealed a significant relationship between work status and work commitment but not between work status and satisfaction. Moreover, work preferences on work schedule and shift were ranked more favorably among nine work-related attitudes (Morrow et al., 1994, 202).

In another study, Barnett, Brennan, and Gareis found the relationship between the number of working hours and burnout level. They hypothesized that employees have their own work-family strategies to realize the needs of their families in the workplace. When the strategies are able to fit with schedules, low stress and higher satisfaction emerge; if not, high stress and dissatisfaction occur. The researchers defined 'fit' as "the extent to which workers realize the various components of their work-family strategies" (Barnett et al., 1999, 307). They developed a nine-item schedule fit measure with a 7-item Likert scale ranging from "extremely poorly" to "extremely well". The main purpose of the study was to identify "How well the number and distribution of their [dual-earner married physicians'] work schedule met their needs" (Barnett et al., 1999, 307). They used structural equation modeling to analyze their mediation hypothesis by

testing a sample of 141 physicians and their spouses. The findings showed that "the better the perceived fit of one's own and one's partner's work schedules, the lower one's feelings of burnout on the job" (Barnett et al., 1999, 314). They also concluded that 'fit' may help to better understand the relationship between work conditions and health issues of couples (Barnett et al., 1999, 315).

From the work scheduling point of view, Holtom, Tidd, and Lee modified Discrepancy Theory in terms of work schedule as "a match or congruence between worker preferences and organizational scheduling practices will enhance positive employee attitudes and productive behaviors" (Holtom et al., 2002, 903). In their study, Holtom et.al. attempted to find the benefits of congruence between employee preferences and their actual work schedule(Holtom et al., 2002, 903). The researchers first developed a work status congruence scale by interviewing 21 workers, and then conducted a confirmatory factor analysis to ensure the scale content validity. Second, they administered surveys, including a 5-item work status congruence scale (Cronbach's alpha was .85), an 8-item scale to assess commitment, and a 4-item scale measuring underemployment in hospitals (Holtom et al., 2002, 907). As a result, the researchers found a significant positive relationship between work status congruence and job satisfaction and commitment. The findings were consistent with the prediction of Discrepancy Theory, that higher the congruence between an employee's desire and actual work schedule, the higher the level of job satisfaction and commitment (Holtom et al., 2002, 904-905). Researcher suggested that organizations need to carefully consider employees' preferences (Holtom et al., 2002, 913).

Gareis, Barnett, and Brennan investigated the schedule fit level of married couples regarding their "job-role quality, marital-role quality, and psychological distress, including both spouses' negative affectivity and the couple's income, marriage length,

and number of children" (Gareis et al., 2003, 1044). They conducted interviews with 105 female "physicians who reported voluntarily working reduced-hours schedules and their full-time-employed husbands" (Gareis et al., 2003, 1044). They found that fit levels between work schedules and the needs of female physicians and their husbands were associated with job-role quality. In other words, the findings indicated that "the better … schedule fit predicted higher job-role quality" for women and men (Gareis et al., 2003, 1050).

Another study supported that the importance of personnel demands was conducted by the United Kingdom Home Office Police. The report recommended management consider national and international regulations for officer welfare that lead to "officer safety, increase morale, provide healthier, less fatigued officers and reduce sickness levels"(The Home Office UK Police, 2004, 10).

2.3. Work Schedules in the Turkish National Police

Very few studies exist on work schedules in the public or private sector in Turkey. Likewise, there are, unfortunately, a very limited number of studies on work schedules in the TNP. In this part of the study, some related studies on work schedules are discussed.

A study by Birsen and Badem which was conducted in 1997(two years after the WTC was introduced) found that one of the greatest problems and dissatisfaction factors among TNP officers was still working hours. The research findings indicate that the factors that affect police officers' dissatisfaction were as follows: excessive workload (40.5%), economic issues (32.6%), lack of time off on weekends (12.3%), and public perception of police (9%). It is clear that police officers mostly complained about the volume of work they have. Also, officers determined that their most important need was a new work schedule. The major needs of officers were listed as follows:

redesigning the work schedule (44.8%), increasing salary (19%), modernizing equipment (14.3%), and providing education and opportunity equity (10.5%) (Birsen and Badem,1997).

Another study on personnel motivation factors carried out by Baycan found that TNP officers expressed a great deal of dissatisfaction with promotion and work schedules. This study compared ranked officers and constables regarding their satisfaction with job related motivation factors. The researcher administrated a survey with 156 constables and 48 ranked officers, for a total of 204 officers. The findings indicated that the constables were less satisfied than the ranked officers with all motivation factors, including economic, social, and other incentives. Almost all of the officers' expectations for salary, work conditions, safety, and social relationships were found higher than their actual salary, work conditions, etc. The researcher concluded that the promotion system and implemented work schedules cause more dissatisfaction than other factors for the TNP officers and he recommended a new promotion system and work schedules to increase personnel motivation (Baycan, 2004).

A more recent study conducted by Demir in 2008 examined the applicability of Herzberg's theory to the TNP, which has a different cultural setting. He tested the relationship between work schedule and job satisfaction and the relationships "between job satisfaction, quality of officers' family life, burnout, and certain aspects of psychological wellbeing (i.e. depression, somatic disorders, and anxiety)" (Demir, 2008, 6-7). In this study, a psychological survey administered to 872 officers working in different units of the Istanbul Police Department. Open-ended questions were also used to classify officer's problems.

As a result of this study, long and irregular work schedules were selected as the most serious problem of 17 problems and caused lower job satisfaction among officers in all units. They, in general, complained "about basic needs such as being unable to rest adequately, ruined eating habits and nutritional problems, no time to meet family needs, and lack of social activities" (Demir, 2008, 131).

In this study, the 12/24 work schedule was found ineffective to meet officers' needs and negatively affect officers' personal, social, and family life (Demir, 2008, 137). Officers with lower job satisfaction were found to have higher levels of burnout, somatic disorders, depression, anxiety, and more complaints of having little time for family (Demir, 2008, 132). These negative consequences derived from discrepancies between expectations and actual situations, which is consistent with the prediction of the Discrepancy Theory. On the other hand, officers with high job satisfaction had better quality of family life. The researcher recommended shorter working periods (8 hours) and decreasing the pace of shift rotation, which is 1.5 days in the 12/24 schedule. Demir stated that the 8/16 schedule system with two days off in a week can be adapted to small cities, and in big metropolitans the 12/36 shift system can be used because of their transportation problems (Demir 2008, 141-142).

From the working hours literature on the TNP, (Birsen and Badem, 1997; Zengin, 1997; Duran, 2001; Department of Research and Development, 2001; Baycan, 2004; Demir, 2008) there are no studies on organizational demands, work schedules that are implemented in the Izmir Public Order Department, and managers' thoughts on work time arrangements. Also characteristics of employees, regions, and units have not been examined in a complete study. Therefore, this study is believed to close these gaps in the literature.

Based on the literature review the following hypotheses were tested:

Hypothesis 1- There are significant relationships between personal schedule satisfaction/fit and characteristics of the area of responsibility.

Null Hypothesis: There is no significant relationship between schedule satisfaction/fit and characteristics of the area of responsibility.

Hypothesis 2- There are significant relationships between personal schedule satisfaction/fit and type of patrol unit.

Null Hypothesis: There is no significant relationship between schedule satisfaction/fit and type of patrol unit.

Hypothesis 3- There are significant relationships between personal schedule satisfaction/fit and personal characteristics of officers.

Null Hypothesis: There is no significant relationship between schedule satisfaction/fit and personal characteristics of officers.

Hypothesis 4-There is significant relationships between schedule fit and schedule satisfaction.

Null Hypothesis: There is no significant relationship between schedule fit and schedule satisfaction.

Hypothesis 5- Regional and unit based differences affect the relationships between schedule fit and schedule satisfaction.

Null Hypothesis: There is no significant impact of regional and unit based differences on the relationship between schedule fit and schedule satisfaction.

METHODOLOGY

3.1. Research Design

In this part of the study, the design of the study is presented, including method, data collection, sampling, data analysis, internal and external validity, ethical issues, significance and the limitations of the study.

3.2. Mixed Method

In this study, a mixed method was used. Mixed method incorporates qualitative and quantitative strategies to obtain the best understanding of a subject, to reduce biases which each of the other strategies have, and to enable the researcher to triangulate data, which enhances the validity of the study (Creswell, 2002, 15). One important disadvantage of the mixed method is that it "take[s] extra time because of the need to collect and analyze both quantitative and qualitative data" (Creswell, 2002, 23). In this study, both qualitative and quantitative data were collected with different tools; secondary data, survey, and interviews to get different points of view, and at the analysis phase of the study, those data were combined and analyzed as a whole.

The conceptual framework of the study is as follows:

Table 3. Visual Model and Procedure of the Study

Organizational Demands (legal requirements, efficiency, flexibility, and manageability)	→	**FIT** **Work Schedule**	→	**Organizational Demands Satisfaction** (Legality, Efficiency, Flexibility, Manageability)
Personnel demands	→		→	**Personnel Schedule Satisfaction**

Based on this framework, the current work schedules used in Izmir patrol units were examined in terms of how well those schedules adapt to national regulations and international standards, provide efficiency, and satisfy job demands and personal needs. The conceptual framework of this study indicates that if organizational demands – legal requirements, efficiency, flexibility, and manageability—fit the work schedule, the administration would: 1) provide a legal schedule and internationally recognized standards to its employees, 2) utilize not only its human resources but also its equipment and time efficiently, 3) respond to crime effectively, 4) provide flexible and manageable work schedules to managers. In addition, if personnel demands fit to work schedules officers would be satisfied. The better the match between work schedule characteristics and personnel and organizational demands, the more schedule satisfaction and better service provisions would be gained. If the characteristics of work schedules do not fit personnel and organizational demands, then dissatisfaction with the schedules, inefficiency, and ineffectiveness in services would increase among both managers and personnel.

3.3. Data Collection

Data were collected with three methods: secondary data, survey, and interview. During the data collection process, the researcher used his academic identity rather than

his occupational identity. The purpose was to eliminate possible impacts of researcher identity on participants.

3.3.1. Secondary Data

In the literature, there are several ways including –but not limited— benchmarking with similar agencies, crime/call for service rates, or population to determine the required number of police officer in a unit (The Home Office UK Police, 2004). In general, call for service, however, was one of the major data to find out workload and the number of required police officers in a shift. In this study, crime rates were collected to understand the demands of patrol units per hour of the week, since data on calls for service in the TNP was unreliable. The administrative/secondary data on crime rates, time of crimes and the number of officers assign per hour of a week were collected to analyze schedule efficiency and flexibility. To analyze legality of the schedules national regulations and international standards were reviewed.

The operational definitions of data were checked and the data were confirmed (triangulated) by using multiple data sources: Turkish Statistic Institute (TurkStat), statistics of the General Directorate of the TNP, and the units' internal reports and statistics.

Turkish Statistic Institute (TurkStat): The TurkStat –first found as the State Institute of Statistics in the Ottoman Empire—was reestablished by Turkish Statistical Law, 25997 in 2005 "with wider authority and responsibilities, and more resources" (TUIK, 2008). The organization is responsible for collecting and analyzing data on all functions of the government (e.g. population, agriculture, industry censuses) at all levels. It publishes all its studies and findings in "Turkey's Statistical Year Book" on the Internet (TUIK, 2008). In this study, TurkStat's web site and its publications were

used, as it was one of the most reliable data sources on population, the size of area of responsibilities (AOR), and other information.

The Statistics of the General Directorate: The General Directorate of the TNP provides data on police related statistics to the public every year. A department of the TNP, General Directorate is responsible for collecting and making available to the public reports and statistics. In this study, those reports and statistics were used to strengthen the unit level data.

Units' Incident Reports and Statistics: Incident reports and statistical data written by patrol units were also collected. Those reports are invaluable for this study in that they provide reliable and sensitive data that increase the validity of the study. On the other hand, secondary data is subject to biases of "selective deposit" (the possibility of keeping selected, favorable records) and "selective survival" (the possibility of keeping some favorable records more than others). To eliminate those potential biases, the operational definitions were checked and multiple sources (triangulating data) were used (Gray, 2004, 267; Basavanna, 2000, 377).

3.3.2. Survey

Survey research is the most commonly used research method of collecting data from a population through a randomly selected sample. A constable helped the researcher to deliver 650 survey questionnaires to the participants along with a stamped envelope with a return address on it. Those envelopes helped attain a high response rate (Creswell, 2002). The survey questions were organized in two parts; in the first part of the questionnaire, participants' demographic characteristics were asked. The demographic questions included age, gender, marital status, number of dependents, rank, seniority, commute method and time, time worked in the current schedule and total time worked in a schedule.

In the second part of the questionnaire, questions on officers' schedule satisfaction and schedule fit were asked with a Likert scale. This part of the questionnaire has two sections developed by Dunham and Pierce (Dunham and Pierce, 1986). The Dunham and Pierce work-schedule scales were set to measure workers' attitudes toward any work schedule in a multi-phase research program involving over 700 participants. The scales also attempted "to explore the predictive effectiveness of several sets of variables for anticipating workers' preferences of work schedules" (Dunham and Pierce, 1986, 171). The scales, which were used in several studies (Venne, 1993; Dunham, 1992 ; Rothausen, 1999; Barber et al. 1992; Dunham et al., 1987) were "examined for their underlying dimensions, internal consistency and test-retest reliability" (Venne, 1993, 143).

In this study, schedule satisfaction and schedule fit survey scales were used. Both scales were constructed with a 5-point Likert scale ranging from "Strongly Disagree" to "Strongly Agree". In addition to those items, another statement, originally developed by Venne, "I would like to change my work schedule," was added to the schedule satisfaction scale to obtain participants' preferences on changing the current work schedule. Cronbach's alpha estimates for the five scales developed by Dunham and Pierce were found at "clearly acceptable levels (.70s and .80s)" (Dunham and Pierce 1986, 176). Venne found the level of Cronbach's alpha for schedule satisfaction was 0.91 and for schedule fit was 0.98 (Venne, 1993, 157), which are acceptable validity and reliability levels (Venne, 1993, 144; Dunham and Pierce, 1986, 179). The survey questions are presented in Appendix C.

The survey questions were translated into Turkish by an English language teacher, graduated from the Department of English Language and Literature at Ankara University. The translated survey was reviewed by a Turkish professor working in the

University of Delaware and two Turkish National Police officers in order to check its reliability and clarity. After that, a pilot survey study was conducted with 23 police officers working in different units to measure the applicability of the questionnaire and to ensure that the questionnaire wording measures what is intended.

3.3.3. Interview

The interview technique was used to explore managers' schedule satisfaction and their opinions on optimum solutions for work scheduling problems (if any) in the TNP. The aim was to explore and to have their observations, experiences, and knowledge on these issues for a better understanding of the subject by getting detailed information and preferences of managers. As the city and patrol unit level managers are responsible for selecting and implementing work schedules, they were interviewed to get the perspectives of the different sides of work schedule policy.

A structured interview using the same pre-prepared open-ended questions for all participants was conducted in person over phone. These structured interviews provided quick, detailed data that was easily analyzed. It also enabled researchers to guarantee anonymity to participants (Gray, 2004, 215). Also managers were invited to rate seven criteria. The criteria were used in a report (The Home Office UK Police, 2004) prepared for England's police to evaluate work schedules from 1 (not important) to 5 (very important). Then the same criteria were used to rate based on the satisfaction level of these criteria with current work schedules from 1 (not satisfied) to 5 (very satisfied). In the original report, eight criteria were used. For this study, two of the criteria; minimizes overtime (canceled rest days) and minimizes overtime (extended working day) were combined and used as only one criteria. The second rating, which was about participants' thought on how well their schedules compliance with those criteria was changed to measure managers' satisfaction with current schedules. The data obtained

from interviews were used to understand and to explain the findings. In addition, data gathered from the criteria table are presented and discussed.

All identifying information about interviewees was kept confidential. The data was stored in a secure place where only the researcher and the committee members had access. The interview records were destroyed at the completion of the study. To keep interviewees anonymous, general permission was requested from the administration of the TNP. Moreover, no specific questions that could disclose an interviewee's identity were asked. The interview questions are presented in Appendix D.

3.4. Sampling

The population of this study consists of all constables and supervisors working in the patrol units of the Izmir Public Order Department. The sample of this study was selected with a stratified purposeful sampling method. In qualitative studies, it is common to combine different sampling strategies to select the sample (Gray, 2004, 324). The stratified purposeful sampling strategy is used when the researcher identifies important strata, sub-groups, in the population. Then, the population is divided and the samples are selected from each group purposely rather than randomly. In this study, population was divided into subgroups based on region and unit, and then samples selected from all subgroups randomly. This ensured all sub-groups to be represented in the sample (Gray, 2004, 325).

In the present study, the population is the group of officers working in two patrol units of the Izmir Public Order Department, uniform patrols and peace teams. There are about 2000 officers working in the uniform patrols and 350 in peace teams. Since crime is one of the key variable used to categorize police units, all officers working in both patrol units within three regions out of five regions with the highest, lowest and medium level of crime density (number of crimes per officer) in Izmir are considered as the

samples of this study. This sampling strategy provided a sensitive representation of both patrol units and regions with different level of crime density. The number of crimes per officer was used instead of number of crimes per person to select three regions among five. Because workload per officer is more essential factor than the crime density of the region based on its population in this study. In other words, since the impact of workload on officers' schedule satisfaction and schedule fit was investigated and crime was selected as workload of police officers, regions with high, medium, and low crime per officer were selected.

Three regions with high, middle, and low crime density were coded as A, B, and C region from higher to lower crime density respectively. To keep confidentiality, only the researcher and the committee members know the regions' name and their codes. The titles of questionnaires were printed in different styles (all letters of titles capitalized, only first letters capitalized, and all letters lower case) for each region. The questionnaires were delivered to officers at the beginning of shifts by an officer who is not working in these units. Officers were asked to return the questionnaires using the provided envelope, which had a stamp and return address printed on it. Two weeks after the first attempt, a second visit was made to ensure all officers who wanted to participate to the survey had an opportunity to do so. This time, the surveys were provided only to officers who had not completed the survey in the first time. The survey was delivered to about 650 officers and 533 (81, 5%) of them sent completed questionnaires back to the researcher.

For the interviews, a homogenous sampling group was selected randomly from managers working in the city and patrol unit level. The managers are responsible for designing or selecting schedules at the city level and the patrol unit level. Two city level managers were selected as they are the ones who have authority to create or select

schedules other than those recommended in the WTC. They are the ones who can identify the demands of police services properly and who are in the best position to evaluate schedules from the administrative point of view. Also two uniformed patrol managers and two peace team managers were added to the interviewee group as they are expected to bring different administrative points of view from the implementation part of the process. They were expected to provide valuable insights about their experiences and about their perspectives on the work schedules.

3.5. Data Analysis

In this study, there are three different data sources: secondary, survey, and interview data. Each type of data was analyzed with different types of analysis methods.

Secondary Data: This data was used to measure the level of satisfaction of organizational demands which are considered into legal requirements, efficiency, flexibility, and manageability. Collected data were analyzed with descriptive and comparative methods. If the work schedule fits the organizational demands, the schedule is considered as a legal, efficient, flexible, and manageable (dependent variables) schedule. Legality of the current work schedules was explored in terms of compliance with national regulations and international standards; schedule efficiency was examined based on the level of fit between job demands (crime rates and crime times) and schedule characteristics; flexibility was measured by investigating how schedules can be adjusted to meet the changing needs of organization and officers; manageability was measured by schedule satisfaction of managers and ease of arranging schedules. In order to examine schedule efficiency, data were put into the Windows Excel program and graphs were generated to understand the visual relationships between crime rates by hour of the week and staff distribution with the current schedules.

Survey Data: A descriptive data analysis was conducted to explore the demographics of participants. While analyzing some of the demographic data, including age, number of dependents, seniority, duration of work in the patrol unit, duration of work in the current work schedule, and total duration of work in a shift system, responses that could reveal the identities of participated officers were top coded. For example, participants with a household size of more than 4 were coded and input into the Statistical Package for the Social Sciences (SPSS) as "+4" to ensure confidentiality.

For the analysis of schedule satisfaction and schedule fit scales, the Chi-Square test and linear regression were used with SPSS 16. Since the level of measurement of schedule satisfaction and schedule fit scales that use Likert scales is interval, each item's scores were summed to obtain overall schedule satisfaction and fit scores (Brace 2004, 86). Since the researcher discovered the chi-square table cells that expected frequencies less than 5, categories of characteristics were combined to increase expected frequencies and validity of tests. For example, two categories of the time of travel variable, "60-80 minutes" and "more than 80 minutes" were combined.

Personnel demands were examined through the dependent variables, schedule satisfaction and schedule fit. The characteristics of officers (independent variables) were collected to better understand their impacts on the discrepancies in schedule satisfaction and fit. The independent variables (age, gender, marital status, number in household, seniority, rank, commute method and duration, time worked in the current schedule and total time worked in a schedule) were tested. Missing data were coded to mode for the categorical variables (Mertler and Vannatta, 2005). The significance alpha level was accepted as 0.05 for all tests.

Interview Data: The data obtained from interviews were used to support and to explain the findings from the secondary data and survey. In addition, data gathered from the criteria table were developed and input into the tables to analyze the collected data (Creswell, 2002, 193). The qualitative data analysis was based on "breaking data down into smaller units to reveal their characteristic elements and structure" (Gray, 2004, 327) and enabled the researcher to interpret and explain the relationships among interconnecting categories (Gray, 2004, 193).

3.6. Internal and External Validity

The researcher collected data from multiple sources, triangulating data, to ensure the validity of the study. Before using secondary data operational definitions were controlled to enable the researcher to find the intended measurable variables.

On the other hand, since self-reporting was used to measure the level of fit between personnel needs and work schedules, self-reporting bias might affect the results of the survey. Moreover, the surveys are subject to order effect (effects of the order of the response options), central tendency (avoiding selection of extreme positions), acquiescence response (agreeing to statements as presented), and pattern answering (ticking boxes in a pattern) biases as the Likert scale was used in the survey (Brace, 2004, 88).

3.7. Ethical Issues

In this study, participants were adequately informed about the nature, risks, purpose, privacy, consequences, etc. of the study with an informed consent statement. The researcher used his identity as a University of Baltimore student instead of his position in the TNP so as not to influence participants' responses, although he works in a different department, the Police Academy, and does not have any authority over any participant in the study.

All collected information was solicited strictly for research purposes. All participants in this evaluation participated voluntarily. The names of interviewees and the units are known only by the committee of the study in order to keep participants and their positions anonymous for security reasons (Fitzpatrick et al., 2004, 315).

3.8. Significance of the Study

This study is expected to contribute to the shift work and scheduling literature. Also it is expected to provide valuable contributions to policing literature with its use of a mixed method to measure both organizational demands and personnel demands in terms of work schedules. The results of this study are expected to provide a broad view of the Izmir patrol units' demands and preferences of officers regarding work schedules, which is expected to assist the organization to develop better work time arrangements.

3.9. Limitations of the Study

This study has several limitations. First of all, this study is limited to the Izmir Police Department in 2008. Second, it aims to examine work schedules implemented by the patrol units of the Public Order Department; therefore it cannot be generalized to other units (Creswell, 2002, 147). Third, the study is limited by the available data collected by the Izmir police departments and the primary data collected in this study. For example, times of crime used in this study were collected in 2 hour interval by the Department. Furthermore, all crimes occurred in 2008 were considered to cause equal workload in order to determine job demand. Categorizing crimes in terms of their workload would provide better understanding of job demand.

FINDINGS

In this chapter, the findings are presented in two sections: findings on organizational demands and personnel demands. How organizational demands are satisfied by work schedules is examined in terms of legality of schedules, and schedule efficiency, flexibility, and manageability. In the second section, the extent to which work schedules satisfy personnel demands was investigated in terms of schedule satisfaction and schedule fit variables.

4.1. Organizational Demands

An optimal work schedule for any organization should balance operational requirements and employee preferences. This part of the study discusses the current work schedules based on organizational demands including legal demands (national and international), efficiency, flexibility, and manageability.

4.1.1. Legality

In this study, the legality of a work schedule is examined in terms of its compliance with national policies, including the Constitution, laws, regulations, directives and circulars. In addition, characteristics of the current work schedules are discussed based on the standards that are recognized by international organizations such as the ILO, EU, and other police agencies.

National Regulations

The national regulations on working hours are examined within a hierarchical scale from the Constitution to Circulars. In the Turkish Constitution, Article 49/2, the State required "to raise the standard of living of workers, and to protect workers … in order to improve the general conditions of labour…" (The TGNA, 1982, Article 49/2). In Article 50/3, rest and leisure time are recognized as the rights of all workers and the "rights and conditions relating to paid weekends and holidays, together with paid annual leave" (The TGNA, 1982, Article 50/3) are required to be regulated by law.

As entailed by the Constitution, the rights of government officers' working hours are arranged by the GOA, no. 657. In the Article 99 of this Act, the government agencies are required to limit the number of working hours with 40 hours at most in a week. And these work time arrangements should not include weekends, unless working hours are arranged by a different by-law or regulation in order to fulfill the agencies' service requirements (GOA, 1965, Article 99). With Article 100, those agencies are required to have approval from the Governor to set start and end time of shifts and rest times (Ibid., Article 100).

On the other hand, the Act recognizes an exception for agencies that serve the public on a 24/7 basis. Such agencies are able to conduct working hours in excess of 40 hours with respect to their resources and service demands. With the approval of the State Office of Personnel Management, these agencies including police departments, fire departments, hospitals, and etc. can use extended schedules (Ibid., Article 101) with an overtime payment (Ibid., Article 178).

The working hours of the TNP were arranged in the "Working Time Circular" (WTC) based on the GOA's provisions (GOA 1965). This Circular was introduced on

September 29, 1995 by the Ministry of Interior. Three types of working schedules (Appendix A) are recommended for DOP's in the WTC. These schedules are named as follows: 12/24, 12/36, and 12/12; the first numbers refer to working hours and the second numbers refer to the hours of rest after shifts (WTC, 1995, Article.4).

Legality Discussion *(National Regulations)*

Based on the Constitution, working hours have to be arranged by law and comply with other regulations in the TNP. As mentioned above, working hours are arranged in the GOA law. The 12/24 schedule, which is used by uniform patrol, is one of the recommended schedules in the WTC. The work schedule used by peace teams was approved by the Governor as mentioned in the WTC. Therefore, it is found and concluded that the schedules implemented by the Izmir Public Order Department (the 12/24 and peace teams' schedule) comply with national regulations.

On the other hand, as Ozturk and Sancaktar argued, policies such as working hours should not be arranged by circulars (Ozturk and Sancaktar, 2001). They recommended that the TNP should arrange working hours with a regulation or a by-law instead of a circular in order to provide better protection of employees' rights (Ibid.). In fact, arranging working hours with a by-law or a regulation for agencies working 24 hours a day was set in the GOA (GOA, 1965, Article 99). In the Turkish legislation system, regulations are prepared by the Council of Ministers to govern "the mode of implementation of laws or [to] designate… matters ordered by law" (The TGNA, 1982, Article 115), and by-laws are issued by "the Prime Ministry, the ministries, and public corporate bodies … to ensure the application of laws and regulations relating to their particular fields of operation" (The TGNA, 1982, Article 124). In fact, circulars are not one of the main sources of Turkish legal norms (laws, regulations, and by-laws). They are used as an order from top administration to lower authorities (Ozturk and Sancaktar,

2001). Correspondingly, many interviewees also addressed the need for a regulation to organize working hours. As a result, although the current work schedules comply with the current national legal procedures, arranging working hours with a regulation is an essential need for better implementation of working time arrangements in the TNP.

After establishing this need, some problems in practice caused by the WTC's provisions are discussed below. First, the definition of an extreme situation is very general and subjective. There is no specific reason or objective criteria for managers to determine when they really need more manpower and when they need to change work schedules from normal schedules (12/24 and 12/36) to the 12/12 schedule. For example, before an event, while some managers require more officers and might change the work schedule to the 12/12 schedule, some might not change the schedule for the same event. This means the Circular leaves this decision completely to the managers' discretion based on their personal experience and attitudes. It is clear that these incomplete arrangements leave two alternatives for managers: (1) s/he can maintain the same schedule during the event and take the risk of handling the event with the same number of officers; (2) or s/he can change the schedule to a 12/12 schedule by accepting the event as an extreme situation and minimize the risk by increasing the number of officers, even if it is not really needed. In addition, since this decision would not cause extra overtime cost to management, managers would not hesitate to change the work schedule. Therefore, the second option is more favorable for any manager as s/he would be prepared for the situation at no extra cost. This will mean more staff at work for extended hours and still officers will be paid the same overtime payment. This regulation problem may lead to manager abuses, officers working more with the same overtime payment, and increased complaints about work schedules.

The second major problem of the WTC relates to overtime arrangements. In Article 4, it is stated that working hours cannot be extended for shift officers except in extreme situations or when managers delay shift changes due to service demands. But this extension or overtime cannot be more than one fourth (¼) of a shift length and overtime hours have to be paid or can be paid as rest time later (WTC, 1995, Article 4). In addition, the Circular requires officers to work between 40 and 56 hours, as all officers are paid a fixed overtime payment. In practice, however, TNP officers work much more than the WTC arranges and overtime hours are paid neither as an overtime payment nor as a rest time to the officers. Zengin made an estimation of 14-16 daily working hours for police officers in the TNP (Zengin, 1997).

The third problem is that there is no regulation governing overtime payment in the Circular. The GOA requires agencies to pay overtime payment or provide a day off (for each 8 hours overtime) when officers worked more than 40 hours (GOA, 1965, Article 178; Sokmen, 1996) and there is no regulation regarding fixed payment. Although there is no practice of paying overtime with vacation in the TNP, a fixed overtime payment was introduced in the Police Department Act, 3201, temporary article 21. In this article, units are divided into three groups based on their difficulties and slightly different overtime pay rates are set for each group. All police officers receive an almost equal monthly payment. This method of payment causes several problems: it enables managers to change schedules to the 12/12 work schedule easily; it causes inequality among officers since the payment is almost equal regardless of their actual overtime; it makes officers reluctant to work overtime, since they are not paid extra money but provided a fixed payment.

International Standards

Besides the national regulations, as a member of the United Nations (UN) and a candidate for full membership of the European Union (EU), Turkey is required to consider international standards on working hours. Turkey is also a member of the International Labour Organization (ILO), which is a specialized UN agency established to formulate "international labour standards in the form of Conventions and Recommendations setting minimum standards of basic labour rights" (ILO, 2008, 5). The ILO, with the Hours of Work Convention (No. 1) of 1919, has begun to establish international norms on work schedules, including maximum standard working time per week and hours per day (ILO, 2004).

In general, the ILO international standards are established to protect the health and safety of workers. Although these standards on working hours are sometimes criticized as being behind the times, they are still widely recognized minimum standards. ILO recommendations on working hours can be summarized as follows:

- a short cycle period with regular rotas should be used;
- individual workers should work few nights in succession;
- individual workers should have some free weekends with at least two full days off;
- short intervals between shifts should be avoided;
- flexibility regarding shift change times and shift length is needed (ILO, 2008).

Based on these general principals, the ILO standards were arranged on working hours as follows: a limit of 8 hours working time a day and 40 hours a week, no overtime limit but requiring national regulation of overtime limit, remuneration of overtime at a rate not less than 25 percent more than the ordinary salary, at least a 24-hour uninterrupted weekly rest period, and a period of annual paid holiday of at least 3 weeks.

Another essential international actor for Turkey to follow on working time arrangements is the EU. Turkey was officially accepted as a candidate for full membership in the EU in 1999 and accession negotiations opened in October 2005 (The Commission of the European Communities, 2008, 4). During the last decade, Turkey has struggled with the integration process of the EU standards (The Council of the European Union, 1993).

The working time issue, which "is one of the most important areas of employment," (The Council of the European Union, 1993) was also arranged by an EU directive. The EU Working Time Directive (WTD) (Council Directive, 93/104/EC) entered into force in November 1993 to protect employees in all sectors, both public and private. The purpose of the Directive is defined as setting "minimum safety and health requirements for the organization of working time" (The Council of the European Union, 1993, Article 1). The core provisions of the Directive are: (a) the daily minimum rest period is 11 hours per 24 hour period (Article 3); (b) if daily working duration is longer than 6 hours, employees need to have a rest break time (Article 4); (c) the weekly minimum uninterrupted rest period is 24 hours (Article 5); (d) the average weekly working hours including overtime is at maximum 48 hours (Article 6); (e) a minimum paid annual leave is 4 weeks per year (Article 7); (f) night shifts should not exceed 8 hours in any 24 hour period (Article 8) (The Council of the European Union 1993). Although the directive requires agencies to set schedules within some standards, the specific standards still cause disagreements among the members of the EU (The Council of the European Union, 1993, 5).

On the other hand, there are no internationally developed standards on working hours among police agencies around the world. But the similar characteristics of police tasks, environments, and resources mean that agencies use the same type of schedules.

Police agencies are required to assign resources adequately to match the demand for police services during each hour of the week (Taylor and Huxley, 1989, 5). Agencies traditionally used to implement "a rotating, eight-hour system of day, evening, and [night] shifts" (Cunningham, 1990, 185) in most western countries.[6] This schedule has a 40-hour weekly limit and equal numbers of officers are assigned at all times (The Home Office UK Police 2007, 5). In the mid-1970's, the compressed work week (CWW), 12-hour shift schedule practices, emerged. In the 80's, as a result of changes in community demographics, forms of crime, social habits, legislative regulations, and increasing demands for new services, police agencies were required to adapt their staffing policies and scheduling procedures. Different variable work time arrangements came into use. Flexible working schedules enable agencies to meet the demand for police services that vary during a day, week, or year (The Home Office UK Police, 2007, 5). However, some of these schedules do not comply with the ILO and the European Union WTD as they exceed the 8-hour daily and night limits and use quick rotation with less than 11 hours of rest between shifts (The Home Office UK Police, 2004, 4).

The current work schedules used by the patrol units of the Izmir Public Order Department are discussed based on the above mentioned international standards to determine the legality of the current work schedules.

***Legality Discussion** (International Standards)*

Historically, the working hour issue has changed from reducing the hours of work to flexible working hours. While the eight hour daily limit or 48 hour weekly limit were the major priority of the worker's organizations and institutions to improve working conditions (ILO, 2005, 2), along with the changing of economic, social, and characteristics of human resources, the standards developed by institutions such as the

6 In the TNP, officers have traditionally worked 12 _ hours morning and night shifts with a total 56 working hours in a week (12/24 system).

ILO and EU became out-of-date in practice. Many developed countries have criticized and become not in favor of ratifying the conventions and recommendations of the ILO standards. They complain that those standards, especially the limits on night, daily and weekly working hours, "prevent the implementation of modern flexible working-time arrangements" (ILO, 2005, 8). Today, governments, as the authorities on working hour policies, set arrangements that provide flexibility for government agencies and for their employees. Meanwhile, new types of work time arrangements have emerged, such as CWW, flexi-time, annualized hours, time banking, and other variations in order to respond to service demands, to extend service hours, to reduce personnel cost, to increase employee autonomy with regard to work schedule, and to meet employees' needs and preferences (Messenger, 2004, 2).

In Turkey, as one of the countries that has not ratified the related ILO conventions and recommendations on working hours, some types of flexible working arrangements have begun to be implemented by private organizations and public agencies. These improvements along with increasingly close relationships with the police agencies of other countries caused some radical changes in the TNP as well. DOPs have begun to use some practices other than the traditional 12/24 working schedule. The most impressive one was initiated by the Izmir DOP. In 2006, a new patrol unit with a new schedule, "Peace Teams" was created by the Chief of Police Huseyin Capkin to close the gap between police service demands and department supplies when and where crimes commonly occur (Interview with a Manager).

Peace teams were established under the Public Order Department, which is responsible for services provided by police stations and patrol units. Traditionally, this unit had included uniform patrols in addition to the police stations' patrols to serve all over the Izmir municipality region. The patrols were responsible for responding to calls

for service, conducting proactive patrolling, and developing community interaction. Formerly, if a uniform patrol intervened in an incident, the patrol handed over the case with the required paperwork to the associated unit or to the station in charge of following up on the case up to the court level. Since the station had its own patrols within the same area, both units were assigning patrols to the same places, which caused misuse of patrols, low efficiency and supply-demand deficit. To increase efficiency and supply-demand match, all officers working on patrol, including uniform patrol and station patrol, were assigned to the Public Order Department. Then, those officers who wished to work in civilian clothes, fully equipped, with 8 hours of daily work within a flexible schedule were selected to work in the peace teams.

All officers working in the Public Order Department except those selected for the peace teams were assigned to uniform patrol in order to provide patrol services from one authority, the Public Order Department. Thus, the Department has provided a minimum level of staffing throughout the responsibility area, with uniform patrols and peace teams assigned only to the places and the times that most crimes occur in order to gain a better supply-demand match. The uniform patrols continued to use the same work schedule, the 12/24 schedule, and the peace teams have begun to work a flexible schedule that can be changed depending on crime trends (Interview with a Manager, November 13, 2009).

With this schedule, peace team officers are able to work 8 hours a day and 40 hours a week during normal work hours. On special days, such as big demonstrations, before and during festivals, and in places and at times when particular types of crimes increase, these officers work overtime to cover the service demands. Both schedules implemented for the uniform patrols and peace teams are analyzed below based on international standards and other police organizations' practices.

The comparisons of the schedules of the uniform teams and peace teams based on the above mentioned standards are presented in Table 4.

Table 4. Comparison of the Schedules of the Uniform Patrols and Peace Teams with the International Standards.

	ILO	EU	Uniform Patrol (12/24)	Peace Team Schedule
Daily Work Limit	8 Hr	8 Hr	12 Hr	8 Hr
Weekly Limit	40-48 Hr	48 Hr	56 Hr	40 Hr
Minimum Daily Rest	11 Hr	11 Hr	24 Hr	16 Hr
Minimum Weekly Rest Period	24 Hr	24 Hr	-	24 Hr
Night Work Limit	8 Hr	8 Hr	12 Hr	8 Hr or less
Overtime Limit	-	48 Hr	16Hr +3Hr	3 Hr
Overtime Payment	+25% ordinary salary		Fixed payment	Fixed payment
Annual Paid Leave	3 weeks	4 weeks	20/30 days	20/30 days

From this table, the two schedules used by uniform patrols and peace teams were analyzed as follows:

Uniform Patrol's 12/24 Work Schedule

1. *Daily Work Limit:* The traditional work schedule, 12/24, involves 12 hours of daily work, which clearly does not comply with either the ILO or EU standards. Although 12 hours of work is practiced by other police departments as in the compressed work week (CWW), those practices require officers to work three or four day-long shifts (of 12 hours) to enable officers to have long rest periods of three or four days. In the 12/24 schedule, however, officers continue to work the entire week without any long weekly rest period.

2. *Weekly Work Limit:* The 12/24 schedule produces 56 work hours weekly, which does not comply with either the ILO or EU standards, which set a limit of 40 hours or 48 hours including overtime. In other police departments' practices, weekly limits of 40 are strictly enforced.

3. *Minimum Daily Rest:* The 12/24 schedule provides a 24-hour rest period between shifts, which complies with the ILO and EU standards (11 hour rest period) and other police departments' practices.

4. *Minimum Weekly Rest Period:* The 12/24 work schedule provides 24 hours rest, so that there is no weekly rest period. The ILO and EU standards and other police departments' practices provide a weekly rest period in addition to a daily minimum rest period. Thus, minimum weekly rest period becomes 35 hours in total for workers in both the ILO and EU standards.

5. *Night Work Limit:* The 12/24 schedule includes 12 hours of night work, which does not comply with either the ILO or EU standard (8 hours). Other police departments also use several schedules that do not fulfill this international limit.

6. *Overtime Limit:* In the 12/24 schedule, in theory, officers work at least 16 hours overtime (16 hours more than the 40 hour weekly limit mentioned in the GOA). In addition, an officer can work more than 56 hours in a week when they are needed. This type of overtime is mandatory and officers do not get any extra payment. Although 3 hours overtime was allowed in the WTC, in practice, officers work more than this overtime limit (Zengin, 1997, 88). This implementation does not comply with the EU standard, which is 48 hours in a week including overtime. The ILO conventions or recommendations did not mention a specific limit for overtime, but it requires member countries to arrange an overtime limit with a regulation. Several other police departments discovered that, especially in the US, police officers work much more than the overtime limit (Vila, 2006, 177).

7. *Overtime Payment:* In the TNP, patrol officers are paid a fixed overtime which is around 120 American dollars, regardless of their individual overtime work. This does not comply with the ILO and EU standards or other police departments' practices, which are based on individual overtime working hours.

8. *Annual Paid Leave:* In the TNP, officers with less than 10 years seniority have 20 days paid annual leave and those with more than 10 years seniority have 30 days. These days comply with the ILO standard, while the EU standard on annual leave that requires 4 weeks to all employees is not fulfilled.

Peace Teams' Work Schedule

1. *Daily Work Limit:* The peace teams' flexible work schedule involves 8 hours of daily work, which complies with both the ILO and EU standards. Eight hours of work is traditionally practiced by other police departments, but it is being replaced with more flexible and compressed work schedules that require shifts longer than 8 hours.

2. *Weekly Work Limit:* The peace teams' schedule involves 40 hours of work weekly, which also complies with both the ILO and EU standards and other nations' police practices.

3. *Minimum Daily Rest:* The peace teams' schedule provides at least a 16 hour rest period between shifts, which fulfills the ILO and EU standard and complies with other police departments' practices of 11 hour rest periods.

4. *Minimum Weekly Rest Period:* The schedule provides 24 hours of rest in a week, which complies with the ILO and EU standards and other police departments' practices.

5. *Night Work Limit:* The schedule provides less than 8 hours night work whenever needed, which complies with both the ILO and EU standard of 8 hours. Other police departments have used several schedules, some of which do not comply with this limit.

6. *Overtime Limit:* In the peace teams' schedule officers work overtime, more than 40 hours, when it is needed. This complies with the ILO and EU standard of a 48 hour weekly limit including overtime.

7. *Overtime Payment:* Peace team officers get the same amount of fixed overtime payment as uniform patrols. Working 40 hours weekly plus overtime and getting the same amount of overtime payment as the uniform patrols makes this practice better in terms of the ILO and EU standards and other police departments' practices.

8. *Annual Paid Leave:* This is completely the same as the uniform patrols and fulfils the ILO standards but does not comply with the EU standard.

Overall, it was found that the 12/24 work schedule complies with two out of eight internationally accepted standards. Those two standards are Minimum Daily Rest and Annual Paid Leave. When both rest periods (daily and weekly minimums) are considered together, officers do not have enough rest time (35 hours) since the 12/24 work schedule does not provide officers a minimum weekly rest period. In other words, the schedule does not provide a separately arranged weekly rest period. Therefore, although the schedule complies with the Minimum Daily Rest standard, arrangement of rest periods does not meet international standards. Also, annual paid leave only partially fulfills the standards, as it does not satisfy the standard of 3 or 4 weeks annual leave for officers whose seniority is less than 10 years. The findings on the 12/24 work schedule

reveal that the overtime limit and overtime payments were the most problematic issues for uniform patrol officers.

As a second result, it was found that the flexible work schedule used by the peace teams met seven out of eight standards. The fixed overtime payment was again found as the most problematic feature of this schedule. The peace teams and their schedule were established as a complementary system to the uniform patrols by providing additional officers where and when they are needed. For both patrol units, overtime payment should be compensated either by providing one day vacation for each 8-hour overtime period or by making payment for each hour of overtime as it is arranged in the GOA (Sokmen, 1996). Thus, officers would earn extra money proportionate to how much they work and police management would use resources efficiently, to avoid paying more for overtime.

4.1.2. Work Schedule Efficiency

The economic aspect of shift work is one of the most important issues on work scheduling, especially for service provider organizations like police agencies, fire departments, and transportation administrations, since personnel expenditures account for a high portion of their budget (The Home Office UK Police, 2004, 9; Taylor and Huxley 1989, 4). Also economic concerns have been the main impetus behind the studies and developments on work schedules for the last few decades. Organizations have been in favor of recent trends in working hours that reduce daily and weekly working hours, to increase work schedule efficiency and to provide flexible schedules (ILO, 2005). A well-designed work time arrangement contributes to employees' health, safety, and quality of life as well as to organizational efficiency by controlling cost (The Home Office UK Police, 2004, 9).

Police agencies, which spend almost 80 percent (The Home Office UK Police, 2004, 9; Taylor and Huxley, 1989, 4) of their budget on personnel, are required to match their operational demands with the number of employees during each hour of work. Efficient work scheduling practices help to control organizational costs, and lead to better service and relationships with other agencies and the public (The Home Office UK Police, 2004, 9). Demand analysis is a technique for identifying the number of employees required for each hour of work by determining the operational demand of each pattern of work (Wolf et.al., 2006). It enables organizations to react efficiently and effectively to operational demands, starting by exploring demand (calls for service, crime rates, etc.) and ending with the clearance of the case (Police Standards Unit, 2005, 10). There are several steps required for demand analysis: (1) Identifying key variables of services; (2) translating demand levels to employee requirements; (3) consulting earlier data on key variables to predict future demand; (4) revising (comparing predicted demand and actual demand to measure accuracy of predictions) (Wolf et.al., 2006).

The demands of police agencies that determine the required number of employees, however, are measured by calls for service (The Home Office UK Police, 2004, 10; Taylor and Huxley, 1989, 5) and other factors such as the number of incidents, population, area of responsibility (AOR), and the number of critical entities (Roberg et al., 2002). In this study, crime rates and crime times were used to measure workload. There are a number of reasons that calls for service data was not used in this study: first, the methods and the records of "calls for service" are not reliable in the TNP, since there is no computerized tracking system. Also a number of incidents that cannot be ignored are reported not to call centers, but to police stations or even to responsible officers directly, which makes it difficult to use calls for service data to measure workload. Second, "calls for service" is not used as a factor for allocating officers by

the Department of Personnel in the TNP, since it is not found to be an essential factor for determining personnel allocation.

Comparisons between crime rates and the number of officers, overstaffing, understaffing, and changeable workload were discussed in order to understand whether the current work schedules provide efficiency to the organization. In the TNP, crime statistics are collected with the same type of crime data forms from all over Turkey. Forms consist of five categories: crimes against human beings, crimes against property, crimes against public safety, crimes against the state, and other crimes. In Izmir, region A has twice as much crime as regions B and C have. Almost 60 percent of crimes against human beings, property, and the state, and 80 percent of crimes against public safety occur in region A. Region B has a middle density of crime, with almost 30 percent of crimes against human beings, property, and the state, and 15 percent of crimes against public safety. And lastly, region C has the lowest crime rates among the studied regions. In region C, almost 10 percent of crimes against human beings, property, and the state, and 5 percent of crimes against public safety were committed in 2008.

These findings are highly correlated with the population of Izmir and the three regions. Izmir's population is about 3,256,000. One and a half million citizens live in the selected areas: region A contains about 56 percent of Izmir's population; region B, about 34 percent; and approximately 10 percent live in region C. The population density in region A is much higher than that of both regions B and C (TUIK, 2007).

This distribution reveals that officer assignment is correlated with regions' population and the rate of crime. Since region A has the highest population and the highest crime rate, region A has the most officers (55%) compared to the other regions. Likewise, region C with the lowest population and crime rates has been assigned the

least officers (10%) of the three regions. The researcher used crimes per officer instead of crimes per person to select the three regions from the five regions of Izmir, since the main aim of the study is to measure officers' workload.

Table 5. Characteristics of Three Regions

	Number of Crimes**	Population*	Crime per Capita	Number of Officers**	Crime per Officer
Region A	25,827	848,226 (56%)	32.84	543 (55%)	47.56
Region B	9,638	510,220 (34%)	52.94	302 (31%)	31.91
Region C	3,085	155,550 (10%)	50.42	135 (10%)	22.85
TOTAL	**38,550**	**1,513,994**	**39.27**	**980**	**39.34**

Source: *TUIK. *Address Based Population Registration System* 2007.
** Izmir Police Department, 2008.

After general information on the regions, the second research question, "Are the current work schedules efficient in terms of the demands of changing crime rates during every hour of the day?" is answered in two parts: comparisons of crime rates and officer allocation in each hour of the day.

Rates of Crime and Patrol Units' Officer in Each Hour of the Day

In this part of the study, the three regions are compared based on crime rates and rates of patrol unit officers for each hour of the day in order to determine how efficiently schedules match job demands. First, numbers of crimes and officers for each region were analyzed to understand regional differences. The fit level was determined by calculating the correlation between number of crimes and staff in each hour of a day. Then all three regions' total crime and staffing rates were compared to determine department efficiency as a whole. In each region, there is no correlation between number of uniform patrols and the number of crimes, as there are equal numbers of staff each hour of the day. Therefore, only correlation levels between total number of crimes and staff, including peace teams and uniform patrols, are compared and presented below.

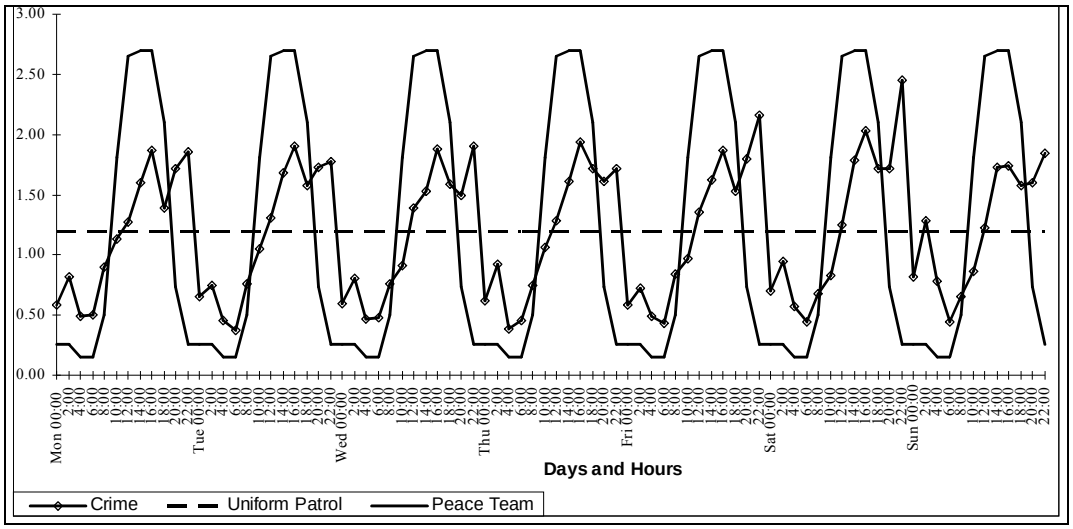
Region A

In region A, crime rates increase from 8am to 6pm (843 to 3572), slightly drop between 6pm and 8pm (to 2987), then begin to increase up to the 10pm-12am interval (3695), the highest level of crime, and then decrease sharply between 12am and 2am (to 1230). Interestingly, almost every day between 2am and 4am, crime occurrences increase slightly (1683) with a different volume among days, and decrease afterwards again up to 8am (843), the lowest crime period for all days of the week.

Table 6. The Number of Crime in a Two-Hour Interval in Region A in 2008.

12am-2am	2am-4am	4am-6am	6am-8am	8am-10am	10am-12pm	12pm-2pm	2pm-4pm	4pm-6pm	6pm-8pm	8pm-10pm	10pm-12am	TOTAL
1230	1683	980	843	1443	1840	2450	3119	3572	2987	3148	3695	**26,990**
4.6%	6.2%	3.6%	3.1%	5.3%	6.8%	9.1%	11.6%	13.2%	11.1%	11.7%	13.7%	**100%**

Figure 6. Comparison of the Number of Crime and Officers per Hour of Each Day in Region A



In Figure 6, it is clear that equal staffing of uniform patrol causes over-staffing at some times and under-staffing at others, while the peace teams' schedule provides a much closer match to the changing demand profile by providing different numbers of staff each hour of the week. The Pearson correlation was found significant at the .001 level. For region A, the correlation between total number of crime and staff, including peace teams and uniform patrols, is .551. The number of officers, especially between

10pm and 12am, needs to be increased, and the number of officers working between 2am and 8am can be decreased for a better supply-demand match.

Region B

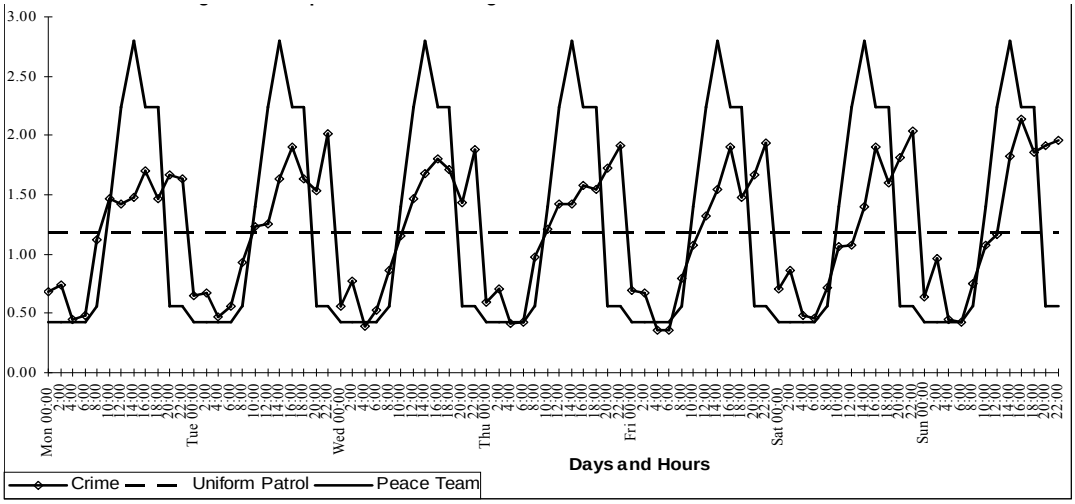
In region B, the crime rate was found to have the same character as that of region A. It increases between 8am and 6pm (314 to 1351), slightly drops between 6pm and 8pm (to 1181), begins to increase between 10pm-12am to the highest level of crime (1400) except on Sunday and Monday, and then the crime rate decreases sharply from 12am to 2am (to 474). The same crime trend occurs in this region: the number of crimes increases slightly almost everyday between 2am and 4am (563) and decreases afterwards to 314. The lowest crime period occurs between 12am and 8am all days of the week.

Table 7. The Number of Crimes in a Two-Hour Interval in Region B in 2008.

12am-2am	**2am-4am**	**4am-6am**	**6am-8am**	**8am-10am**	**10am-12pm**	**12pm-2pm**	**2pm-4pm**	**4pm-6pm**	**6pm-8pm**	**8pm-10pm**	**10pm-12am**	**TOTAL**
474	563	314	337	643	864	954	1148	1351	1181	1228	1400	**10,457**
4.5%	5.4%	3.0%	3.2%	6.1%	8.3%	9.1%	11.0%	12.9%	11.3%	11.7%	13.4%	**100%**

For region B, the Pearson correlation score between total number of crimes and patrol unit officers was found to be significant, with a value of .562. The characteristics of staff allocation were found to be almost the same as those in region A. Uniform patrols were assigned in the same number to each hour of the day, which was the reason for over- and under-staffing. On the other hand, staff allocation of peace teams follows the crime rate much more closely during the week, although there are some periods in which rates of crime and number of officers are inconsistent.

Figure 7. Comparison of the Number of Crime and Officers per Hour of Each Day in Region B



Region C

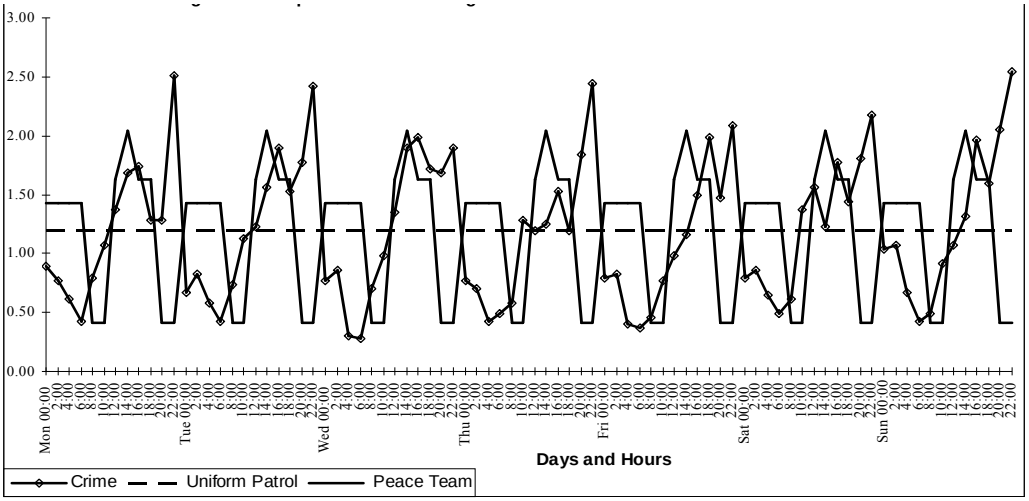
The crime rate characteristics of region C are very similar to those of the other two regions. Crime occurrences increase between 8am and 6pm (from 95 to 405), and slightly—but more than other regions—fall between 6pm and 8pm (to 351). They reach the highest level of crime (525) between 10pm and 12am in region C, and the highest percentage of crime in all regions at 16.1 percent. Then the crime rate decreases sharply between 12am and 2am (to 187), increases weakly in the 2am to 4am interval (193), and then goes down to the lowest level between 6am and 8am (95).

Table 8. The Number of Crimes in a Two-Hour Interval in Region C in 2008.

12am-2am	2am-4am	4am-6am	6am-8am	8am-10am	10am-12pm	12pm-2pm	2pm-4pm	4pm-6pm	6pm-8pm	8pm-10pm	10pm-12am	TOTAL
187	193	119	95	143	246	286	330	405	351	389	525	**3,269**
5.7%	5.9%	3.6%	2.9%	4.4%	7.5%	8.7%	10.1%	12.4%	10.7%	11.9%	16.1%	**100%**

Again uniform patrol with equal staffing caused misallocation. The officer rates of peace teams in general did not match the changing crime rates, and since there was less crime, the number of peace team officers was very few compared to regions A and B. There was no correlation between total number of crimes and patrol unit officers in region C.

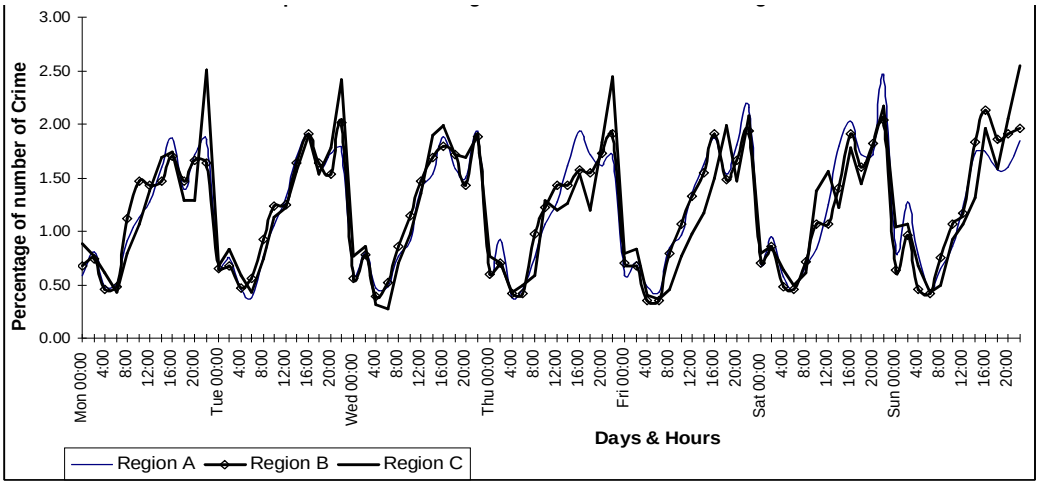
Figure 8. Comparison of the Number of Crime and Officers per Hour of Each Day in Region C



All Regions

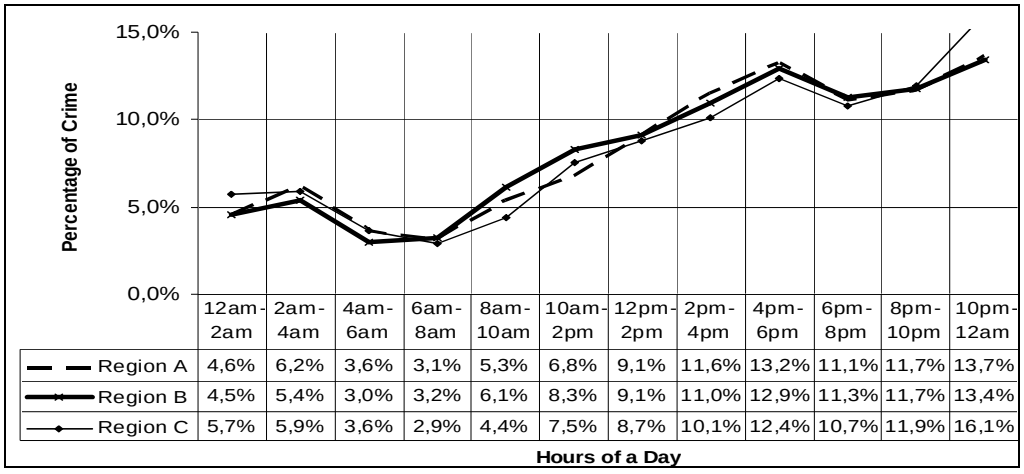
From the comparisons of rates of patrol unit officers and crime, job demand (which was measured by crime rates) was found to be an unstable characteristic in each hour of the week in all regions. The general characteristics of crime rates, such as the peak time of crimes, the distribution of crime rates, and the differentiations between weekdays and weekends, were very similar to findings of earlier studies (Taylor and Huxley, 1989; RCMP, 1995). Each region has peak crime rates between 10pm and 12am on weekdays. The least crime occurs between 4am and 6am. The volume of crime increases on weekends compared to weekdays.

Figure 9. Comparison of Crime Rates per Hour of Each Day in Three Regions



In each region, uniform patrols were assigned equally to each hour of the day and peace team officers were allocated to each hour of the day in a different pattern. The equal staff allocation which is used by uniform patrols was generally considered an inefficient schedule (RCMP, 1995, 9). On the other hand, peace teams are used to changing their schedule depending on crime trends within their regions. Therefore, the exact numbers of officer for each hour of the week for 2008 could not be entered into the supply-demand charts. A general allocation pattern was used to understand the work schedule that is used by peace teams (Appendix B).

Figure 10. Comparison of Crime Rates in Three Regions

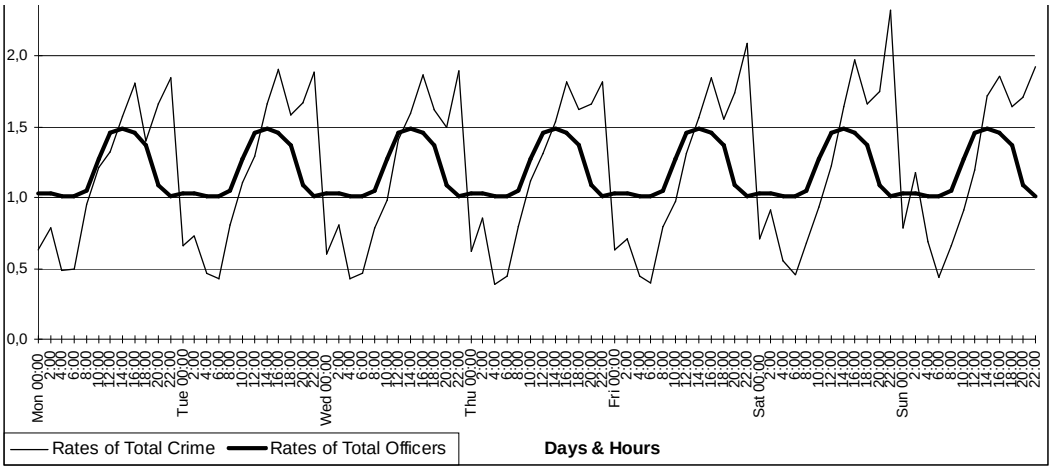


	12am-2am	2am-4am	4am-6am	6am-8am	8am-10am	10am-2pm	12pm-2pm	2pm-4pm	4pm-6pm	6pm-8pm	8pm-10pm	10pm-12am
Region A	4,6%	6,2%	3,6%	3,1%	5,3%	6,8%	9,1%	11,6%	13,2%	11,1%	11,7%	13,7%
Region B	4,5%	5,4%	3,0%	3,2%	6,1%	8,3%	9,1%	11,0%	12,9%	11,3%	11,7%	13,4%
Region C	5,7%	5,9%	3,6%	2,9%	4,4%	7,5%	8,7%	10,1%	12,4%	10,7%	11,9%	16,1%

Hours of a Day

Although each patrol unit was compared separately based on crime rates to understand the total efficiency of the Izmir Public Order Department, the rates of both patrol unit officers were compared below with the total crime rates in the three regions.

Figure 11. Comparison of Rates of Total Crime and Officers in Each Hour of the Week



From this figure, it is clear that establishing peace teams and implementing a flexible work schedule provides a much closer match to job demands than having an equal number of officers working the 12/24 schedule. The distance between the solid line and hatched line indicates over- and under-staffing. The Pearson correlation coefficient for total number of crimes and number of patrol unit officers was found significant, with a value of .535 for all three regions.

Gay et al. presented the inefficiency of equal staffing in Table 9. Peak et al. commented that if the most crime occurs during the evening shift and 20 officers are satisfactory for this demand, the number of officers for other shifts can be reduced to match allocation to call for service demands. They conclude that the surplus officers might be transferred to understaffed units or redeployed to set up a crime prevention unit (Peak et.al., 2004).

Table 9. Two Plans for Allocating Patrol Resources

Shift	Percentage of Total Calls for Service by Shift	Deployment Options	
		Option One Equal Staffing	Option Two Efficiency[7]
Midnight	20%	20	9
Day	35%	20	16
Evening	45%	20	20
Total personnel deployed [8]		60	45

Source: Adapted from U.S. Department of Justice, National Institute of Law Enforcement and Criminal Justice, *Improving Patrol Productivity*, Volume I: Routine Patrol by Gay et al. (Washington, DC: U.S. Government Printing Office, July 1977), 26-29. Cited in Peak, Kenneth J.,Larry K. Gaines, and Ronald W. Glensor. 2004. *Police Supervision and Management*. New Jersey: Pearson Prentice Hall. p. 297.

In 2006, the Izmir DOP initiated a new human resource allocation policy led by Huseyin Capkin, the Chief of Police. First, a minimum required number of patrols were determined for each region and shift. Second, the locations and times that needed more officers were supported by assigning peace teams. Because of the unstable assignment of peace teams to the regions and times, the researcher could not measure and present how well the current work schedules match organizational demands exactly. But as a whole system, the Izmir police patrolling system was found to be very efficient by providing a minimum staffing level for each region and each hour of the day, and adding extra manpower to regions at certain times of the day depending on crime trends. This result is consistent with the findings of the department that were released to the media.

Chief of Police Huseyin Capkin illustrated the performance of the peace team initiative by providing the Department a report on the number of crimes in 2007 and 2008. He reveals that the daily average crime rate decreased from 900 to 200, robbery from 600 to 60-70, purse-snatching from 250 to 1-2. The average response time to an incident decreased from 20-25 minutes to 3-5 minutes. Moreover, the clearance rates of

7 "The efficiency option assumes that the 20 officers assigned to the Evening Shift are sufficient to respond to all calls for service and provide adequate preventive patrol during the peak demand period" (Peak et al. 2004).

8 "This total reflects only the number of officers deployed and not the total complement actually needed, because the relief factor was not considered" (Peak et al. 2004).

cases and the number of arrests in 2008 increased 4 times more than in 2007 (www.polis.web.tr, February 24, 2008). Since this is the first study on peace teams, the researcher could not find other data or explanations for the reduced crime rate other than what the Department released.

Efficiency Discussion:

From an efficiency point of view, all regions revealed different efficiency scores based on fit level between the number of crimes and the number of officer assigned each hour of the day. The highest correlation score (.562) was found in region B, and the second highest score (.551) was in region A. There was no correlation found between the number of crimes and officers in region C. The correlation between total number of crimes and patrol unit officers from the three regions was .535. These findings demonstrate that regional differences affect the efficiency of current work schedules. Although there were different assignment strategies among regions, the number of officers should be re-considered based on the changing job demands of each hour of the day.

Besides regional differences, patrol units have different results in terms of fit level between the number of crimes and number of officers assigned each hour of the day. Uniform patrols were assigned in equal numbers each hour of the day, regardless of regions' demographic characteristics, and rates and times of crimes. Therefore, no correlation was found between variables. But it was clear that the Izmir Police Department accepted the uniform patrols as the minimum required staff in their area of responsibility for each hour of the day, while peace teams became supportive forces to respond to the dynamic aspects of crime at different hour of the day. Although the insufficient and inefficient equal allocation method was used for uniform patrols,

establishing peace teams and implementing such a flexible work schedule led to much better efficiency scores.

Changing the work schedule from the 12/24 schedule to the peace teams' schedule has provided 40 working hours in a week. The new schedule appears to have more rest time and less working hours than the 12/24 schedule for peace teams. On the other hand, these developments have not made any differences at the individual level for officers working in uniform patrol. Officers working in uniform patrol, who represent more than eighty percent of all officers of the Izmir Public Order Department, were still working the insufficient 12/24 schedule. Furthermore, equal staffing not only mismatches the demand profile but also is likely to negatively affect response times and officer safety. In addition to supporting regions with peace teams, officers in civilian clothes, management can consider changing the number of uniformed patrols depending on crime rates. If the number of peace teams increases, or the uniform patrol schedule changes, better efficiency scores can be achieved.

4.1.3. Flexibility

Work schedule flexibility refers to meeting variable police demand by flexible deployment throughout the day, week, and year. There are variations of flexible work approaches "among countries, industries, and companies according to different cultures, history, socio-economic conditions, work sectors, unions' power, and industrial relations" (Costa et.al., 2004, 835). Some approaches to making work schedules flexible include self-determined start and end times of work, part-time work, fixed shifts, working from home, and variable shift arrangements (VSA) (Costa et.al., 2004, 835). Part-time refers to working less than 35 hours a week; fixed shift refers to a shift that is selected permanently by the worker; working from home refers to enabling employees to work outside the work place; variable shift arrangement refers to working more or

less than 8 hours within a period of time, but not more than the regular hours of work in a week (The Home Office UK Police, 2007).

As a cost effective method of staff allocation, flexible work schedules promote officers' autonomy over their working time and enable them to satisfy their needs including: "childcare, care of elderly and disabled parents and relatives, disabled family members, own disability needs, growing domestic needs in the home, increased travel time (to and from work), and age needs" (The Home Office UK Police, 2007, 20-21).

Flexible work schedules have several benefits to police services. These benefits can be listed as follows:

- retention of valuable officers and staff;
- wide diversity of recruits attracted to the Service;
- reduced recruitment and training costs;
- flexible working to meet operational demands;
- reduced sickness absence; and
- improved morale and commitment. (The Home Office UK Police, 2007, 6)

In this study, schedule flexibility was examined based on organizational and personnel flexibility. Organization based flexibility, "meet[ing] the needs of employers, e.g., changing operational times, varying customer and service times" (Costa, 2004, 834), was measured by comparing the fit level between days of the week/seasons and number of officers. Individual based flexibility of schedule, "meet[ing] the changing needs of employees in different phases of life (e.g., studies, family, aging)" (Costa, 2004, 834), was measured by three survey questions that used a 5-item Likert scale: " The current work schedule affects my family life negatively," "The current work schedule makes it easy for me to coordinate my schedule with schedules of other family members," and "The current work schedule affects my social life negatively."

a. Organization Based Flexibility

To measure organizational based flexibility, the number of officers scheduled to work in a given schedule was investigated to determine whether it was correlated with variable demand depending on hour of the day, day of the week and season. Organizational demand that changed based on hour of the day was discussed above; weekly and seasonal demand change is discussed below.

Crime Rates by Days of the Week:

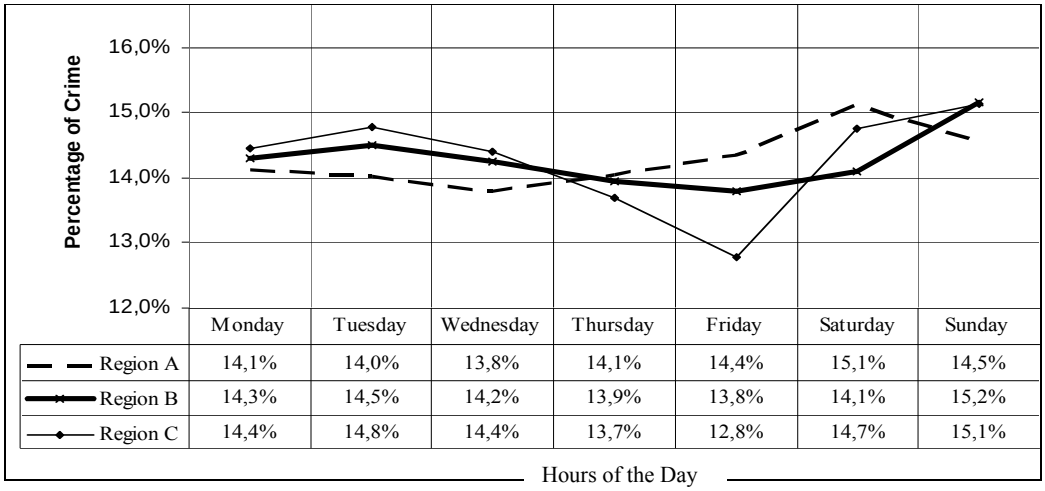
In this part of study, the crime rates of the three regions were compared to determine if patrol units' job demand changes depending on day of the week. If the demand changes, the number of officer needs to be adjusted for a better supply-demand match. The level of adjustment functioned as the flexibility of the work schedule.

Table 10. Daily Crime Trends in a Week

Day / Number of Crimes	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Region A	3809	3784	3724	3793	3874	4080	3926
Region B	1494	1515	1489	1457	1442	1475	1585
Region C	472	483	471	448	418	482	495

It was found that crime rates have different characteristics depending on day of the week for each region. Crime occurs in somewhat similar percentages on Mondays, and the highest crime percentage on a weekday happens on Tuesdays in both region B and region C. In weekdays, the lowest crime rate is found on Wednesdays for region A, while it is Friday for regions B and C. On weekends, while crime rates increase and reach the highest rates on Saturdays in region A, crime rates start to increase after Friday and reach the highest rates on Sundays in regions B and C.

Figure 12. Comparisons of Daily Crime Rates of All Regions



	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Region A	14,1%	14,0%	13,8%	14,1%	14,4%	15,1%	14,5%
Region B	14,3%	14,5%	14,2%	13,9%	13,8%	14,1%	15,2%
Region C	14,4%	14,8%	14,4%	13,7%	12,8%	14,7%	15,1%

Weekly crime trends reveal the following findings:

- Crime trends reveal differences among regions and between rural area C, and the urban areas, regions A and B.
- Crimes occurred mostly on Saturdays in region A and mostly on Sundays in regions B and C.
- In region A, crime occurrence increased from Wednesdays to Saturdays, and then began to decrease from Sundays.
- In regions B and C, interestingly, Sundays have the highest crime rates, and Fridays have the lowest. The low crime rates on Fridays can be explained by the fact that Friday is a holy day for Muslims, who are the majority in Turkey. Since region A is the more urbanized site, it has more clubs, bars, and other entertainment venues, and so it has same crime trends with other countries.
- In regions B and C, Tuesdays have higher crime rates than the other weekdays, while Fridays had the highest crime rates for region A.

Crime Rates in Seasons:

Likewise, seasonal crime rates were found to have different characteristics in different regions. While spring had the highest crime rates for regions A and B (26.36%

and 26.21% respectively), summer had the highest crime rates for region C (25.57%). Region C had the same amount of crime in other seasons as in summer (24.81%). Interestingly, winter was found to have the second highest crime rates for regions A and B.

Table 11. Seasonal Crime Trends

Seasons / Region	Spring	Summer	Fall	Winter	Total
Region A	7114 (26.36%)	6466 (23.96%)	6520 (24.16%)	6889 (25.53%)	26989 (100%)
Region B	2741 (26.21%)	2577 (24.64%)	2559 (24.47%)	2580 (24.67%)	10457 (100%)
Region C	811 (24.81%)	836 (25.57%)	811 (24.81%)	811 (24.81%)	3269 (100%)

This table is visualized in Figure 13 to better understand the relationship between crime rates of regions in different seasons. Region C, a rural area, has a different pattern than regions A and B, which are urban areas. The times of crimes in seasons were compared and crime rates in the three regions were found to be slightly different. In all regions, the crime rate ranged from 23.96 percent to 26.36 percent between the seasons. In regions A and B, crime rates demonstrated the same trends among seasons, while crime rates had different pattern in region C.

Figure 13. Comparison of Seasonal Crime Trends in Regions

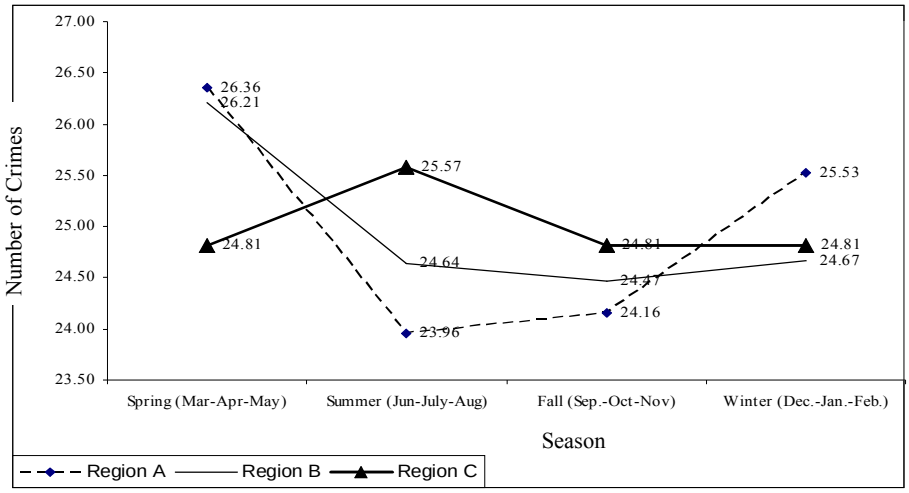


Figure 14. Comparison of Seasonal Crime Trends in Region A

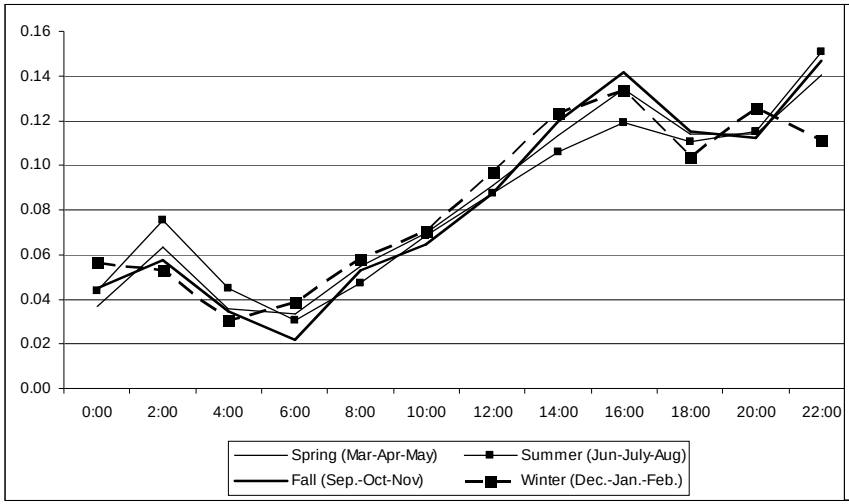


Figure 15. Comparison of Seasonal Crime Trends in Region C

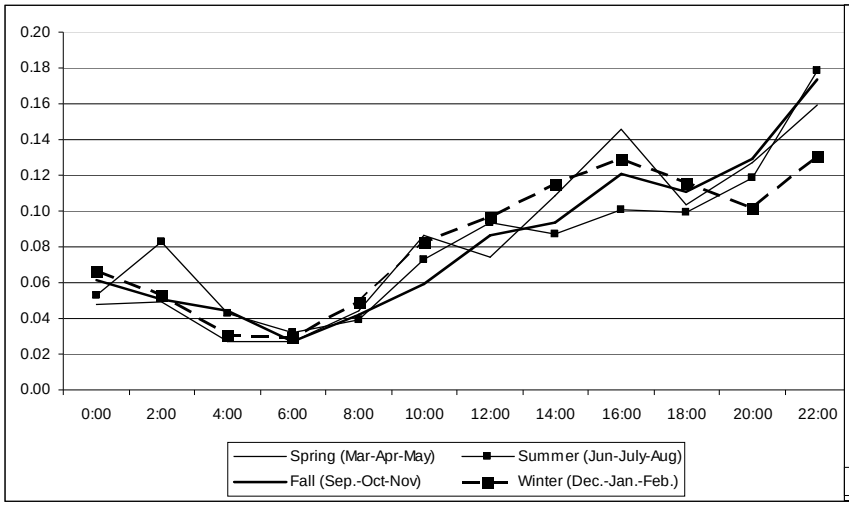


Figure 16. Comparison of Seasonal Crime Trends in Region B

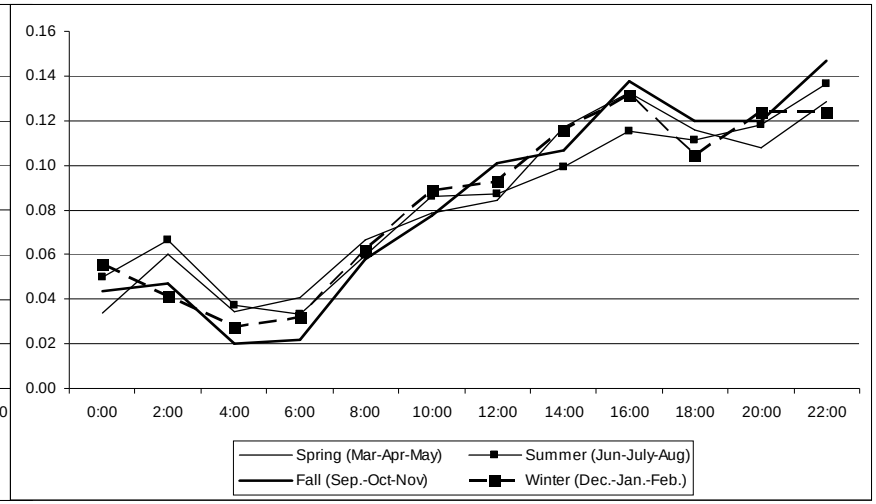
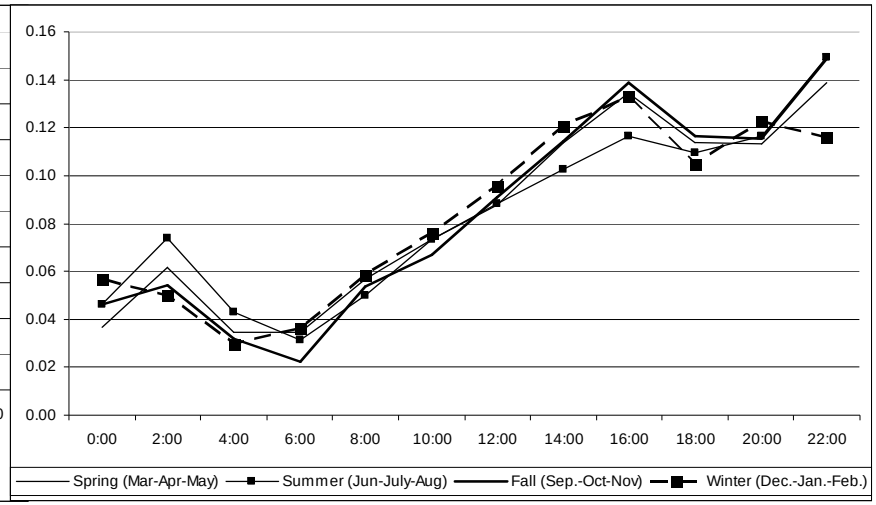


Figure 17. Comparison of Seasonal Crime Trends in All Regions



Seasonal crime trends revealed the following findings:

- Regions A and B have the highest number of crimes during spring, while region C has the highest number of crimes during summer.
- Hourly crime trends are very similar among regions throughout seasons.
- The least crime occurs between 4am and 6am, while the most crime occurs between 10pm and 12am in all regions.
- Region C has a different crime patterns than the other regions. Specifically, in summer and fall, crime rates sharply increase after 8pm, and after 10pm crime rates reached the highest occurrence percentage of crime in any hour of any region.

Although crime trends were found dissimilar among seasons, none of the schedule flexibility methods such as part-time work, fixed shifts, annualized hours, variable shift arrangements, and working from home were used to meet the variability of job demands in the Izmir Police Department. The 12/24 schedule in particular was found inefficient and inflexible to meet the changing workload, that is, crime rates. The peace teams' work schedule, which can be considered a variable shift arrangement, was found fairly flexible for the Department by providing different numbers of officers when they are required.

b. Individual Based Flexibility

Individual based flexibility of schedule refers to meeting the changing needs of officers (Costa, 2004, 834). Individual based flexibility of schedule was measured by analyzing three statements *"The current work schedule affects my family life negatively", "The current work schedule makes it easy for me to coordinate my schedule with schedules of other family members"*, and *"The current work schedule affects my social life*

negatively", that were used in the schedule satisfaction survey in this study. These statements were answered with a 5-item Likert scale.

Table 12. Analysis of Question: "The current work schedule affects my family life negatively" by Units

	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
Uniform Patrol	145	121	28	58	30
	38.0%	31.7%	7.3%	15.2%	7.9%
Peace Teams	17	14	11	51	55
	11.5%	9.5%	7.4%	34.5%	37.2%

Chi-Square: 1.215, df: 4, p= .000

The first statement was "The current work schedule affects my family life negatively." The majority of participants working in uniform patrol strongly agreed (38%) or agreed (31.7%) that the current work schedule, the 12/24 schedule, affects their family life negatively. On the other hand, officers working in peace teams strongly disagreed (37.2%) or disagreed (34.5%) with this statement. When these results are considered along with the results of interviews, it can be concluded that the work schedule used by peace teams was much more flexible than the 12/24 schedule in allowing officers to meet their family needs.

Table 13. Analysis of Question: "The current work schedule makes it easy for me to coordinate my schedule with schedules of other family members" by Unit

	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
Uniform Patrol	38	69	34	92	149
	9.9%	18.1%	8.9%	24.1%	39.0%
Peace Teams	40	44	23	25	16
	27.0%	29.7%	15.5%	16.9%	10.8%

Chi-Square: 62.064, df: 4, p= .000

The second statement was "The current work schedule makes it easy for me to coordinate my schedule with schedules of other family members." Most uniform patrol officers (39%) strongly disagreed that the 12/24 schedule it makes easy for them to arrange

their schedule with those of other household members. Controversially, peace team officers strongly agreed (27%) or agreed (29.7%) that their schedule helps them to coordinate their schedule with other family members. These results demonstrated that officers found the peace teams' work schedule more helpful than the 12/24 schedule for arranging their schedules with their family members.

Table 14. Analysis of Question: "The current work schedule affects my social life negatively" by Unit

	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
Uniform Patrol	142	124	35	59	22
	37.2%	32.5%	9.2%	15.4%	5.8%
Peace Teams	22	20	25	49	32
	14.9%	13.5%	16.9%	33.1%	21.6%

Chi-Square: 79.555, df: 4, p= .000

The third statement that was used to measure individual based flexibility was "The current work schedule affects my social life negatively." The majority of uniform patrol officers strongly agreed (37.2%) or agreed (32.5%) that the 12/24 schedule affects their social life negatively. On the other hand, peace team officers strongly disagreed (33.1%) or disagreed (21.6%) that their social life was affected negatively by their work schedule.

The findings of the three different statements of the schedule satisfaction survey supported each other, and we conclude that peace team officers feel that their schedule is more flexible than the uniform patrol officers do.

Flexibility Discussion:

Flexible work schedules have been used increasingly by organizations to meet social and family needs. Several studies found positive effects of flexible schedules on employees' quality of life (Baltes et al., 1999, 496; ILO, 2005). Baltes et al. found that

"flexible work schedules favorably influenced productivity, job satisfaction, absenteeism, and satisfaction with work schedule" (Baltes et al., 1999, 505). The flexibility of a work schedule increases by applying part-time work, fixed shifts, annualized hours, variable shift arrangements, and/or working from home (ILO, 2005). Unfortunately, none of these types of working methods are used by the TNP or by the Izmir Police Department. Only the work schedule of peace teams can be considered a type of variable shift arrangement. The peace teams' schedule is more flexible than the 12/24 schedule in terms of organizational and individual based flexibility. It helps the Department by providing variable staff allocation and a higher number of patrols on Friday nights and weekends. Correspondingly, this schedule enables peace team officers to control of their time out of work.

Overall, as an entire system, current work schedules provide some amount of organization based flexibility to meet the changing workload, but need to be extended throughout the Department. This can be managed by increasing the application of some kind of work schedules similar to the peace teams' schedule. Regarding the individual based flexibility of schedules, the 12/24 schedule was considered as an extremely inflexible schedule with its fixed characteristics. On the other hand, officers working in peace teams were remarkably satisfied with their schedule's flexibility in allowing them to meet their social and family needs. These findings are consisted with prior flexibility of schedule research. Schedule satisfaction was positively affected by increasing employees' perceived flexibility of work schedule (Baltes et al., 1999, 499).

4.1.4. Manageability

Manageability refers to the ease of arranging shift patterns. The factors that the London Home Office developed to measure the ease of a schedule were used in this study. The ease of uniform patrol and peace teams' schedule manageability was measured with

the number of shifts, start and end times, length, rotation, and flexibility (RCMP, 1995, 29). In the below table, examples of simple and complex patterns of work schedule characteristics are presented. The only modification is that "Start Time" factor was changed to "Start and End Time" for this study. Using these factors, two schedules used by uniform patrols and peace teams were compared to determine their manageability characteristics.

Table 15. Comparisons of Characteristics of Schedules Based on Simplicity and Complexity Criteria

Characteristics	Uniform Patrol	Peace Teams
1-Number of Shifts	Simple (Day and Night Shifts)	Complex (Various Shifts)
2-Start and End Time	Simple (Fixed Times)	Complex (Different Start and End Times)
3-Length	Simple (12 Hours)	Complex (8 Hours or less)
4-Rotation	Simple (Fast but Fixed Rotation)	Complex (Changeable and Flexible)
5-Flexibility	Simple (Fixed Factors)	Complex (Flexible on Length and Start Time of Shifts)

First, in terms of number of shifts, the 12/24 schedule of uniform patrols has two standard shifts (day and night). The schedule of peace teams has various types of shifts depending on crime trends such as shifts between 7am-1pm, 1pm-7pm, 2pm-10pm, and 6pm-2am. Therefore, the 12/24 schedule can be considered a more easily manageable schedule than the peace teams' schedule based on the number of shifts.

The second factor considered as a manageability factor was the start and ending times of shifts. The more irregular the start and ending times of a schedule, the more difficult it is to manage the work schedule. The 12/24 work schedule has a fixed time for shifts to start and end. Thus, the 12/24 schedule was observed to be a very easy schedule to

manage compared to peace teams' schedule. Peace teams can start or end work depending on crime trends or other work demand factors.

Third, the length of the 12/24 schedule, in theory, is fixed at 12 hours, whereas peace teams' schedule can last between 5 and 8 hours. That is why the 12/24 schedule was perceived as easy to manage. In reality, as discussed in detail above, the length of the schedule can be changed without any notice and pay.

The fourth element of schedule manageability was speed of rotation. The 12/24 schedule has a faster rotation speed than the peace teams' schedule. Uniform patrols change their shifts continuously from day to night shifts. Therefore, a patrol works in a day shift, then comes to a night shift the next day, and then works a day shift again. This automated system makes the schedule easy to manage, while the peace teams' schedule provides a more complex, flexible, and changeable system.

The last variable of manageability of schedules is flexibility. As discussed in detail above, the 12/24 schedule was found to have more fixed characteristics than the peace teams' schedule. The more fixed factors a schedule has, the easier it is to manage. Thus, the 12/24 schedule is a much more easily manageable schedule than the peace teams' schedule in terms of flexibility.

Overall, manageability of schedules was measured by analyzing five factors, including number of shifts, start and end times, length, rotation, and flexibility. Findings revealed that the 12/24 schedule with its fixed shifts (day and night), start and end times, length of shifts, and speed of shift rotation, is an easy schedule to manage. That might be one of the reasons managers have used this schedule for a long time. On the other hand, the peace teams' schedule, with its variable arrangements, is considered more complicated than

the 12/24 schedule. Creating variable schedules like the peace teams' schedule can be easier to arrange by using computer based programs.

4.2. Interviews

Interviews were conducted to explore the level of managers' schedule satisfaction and their opinions on optimum solutions for work scheduling problems (if any) in the TNP. A structured interview which has the same open-ended questions for all participants was conducted in person over the phone. Six interviewees randomly selected among city level police managers and patrol unit team managers (2 per unit). Two city level managers were interviewed to identify demands of police services and to obtain their evaluation of schedules from an administrative point of view. In addition, patrol unit level managers brought different administrative points of view from the implementation part of the process.

The information collected from interviews was used to understand and explain the findings from the secondary data and survey. From the interview study, it was found that city level managers are more satisfied with current schedules than patrol unit level managers. In general, city level managers believe current work schedules, as an entire system, satisfy organizational and personnel demands. But they also agreed that peace team officers are more satisfied than uniform patrol officers. City level managers agreed that job satisfaction of patrol officers is essential for the quality of service in the field. On the other hand, patrol unit level managers who work in uniform patrol believe that the 12/24 work schedule partially meets organizational demands. Peace team managers interviewed also believe the 12/24 schedule is necessary for the entire working system but that it also causes low personnel performance. They consider the peace team work schedule to meet both organizational and personnel demands. Almost all managers stated that both schedules are required to satisfy department demands.

Table 16. Managers' Ratings of Work Schedule Criteria

	IMPORTANCE OF CRITERIA							12/24 SCHEDULE							PEACE TEAMS' SCHEDULE						
	City Manager		Patrol Level Manager				Ave.	City Manager		Patrol Level Manager				Ave.	City Manager		Patrol Level Manager				Ave.
	1*	2	3*	4*	5	6		1*	2	3*	4*	5	6		1*	2	3*	4*	5	6	
Improves performance against indicators	5	4	5	4	5	5	4.67	5	3	1	4	2	2	2.83	3	4	4	4	5	5	4.17
Minimizes overtime	5	4	5	4	5	5	4.67	2	2	1	3	2	2	2.00	1	4	3	3	5	5	3.50
Minimizes sickness / absenteeism	1	4	4	4	5	5	3.83	1	2	1	4	1	2	1.83	1	4	4	2	5	4	3.33
Good quality of life for officers	5	5	4	5	5	5	4.83	3	2	1	4	1	2	2.17	4	4	5	4	5	5	4.50
Popular with officers	5	5	4	2	4	5	4.17	4	3	3	4	3	3	3.33	4	4	4	4	5	5	4.33
Meets all Laws and police regulations	5	5	4	4	4	4	4.33	5	2	3	4	2	4	3.33	3	4	2	4	5	5	3.83
Provides a match with demand	5	5	4	4	5	5	4.67	1	2	2	3	4	4	2.67	1	4	1	4	5	5	3.33
I am satisfied with the schedule								2	2	1	2	1	3	1.83	1	4	4	4	5	5	3.83
Average	4.4	4.6	4.3	3.9	4.7	4.9	4.45	2.9	2.3	1.6	3.5	2	2.8	2.50	2.3	4	3.4	3.6	5	4.9	3.85
City vs. Patrol Level Managers' Average	4.5		4.43					2.56		2.47					3.13		4.22				
Uniform Patrol Managers' Average	4.19						**4.45**	2.67						**2.50**	3.08						**3.85**
Peace Team Managers' Average	4.71							2.33							4.63						

***** Interviewees 1, 3, and 4 were working in the uniform patrol unit.

From a general point of view, managers mentioned that work schedules affect job satisfaction. A city level manager who works in uniform patrol believes that there are officers who are satisfied and dissatisfied with both schedules. For example, single and young officers like to work the 12/24 schedule since they want more leisure time between shifts. On the other hand, peace teams' city level manager suggests that peace team officers are more satisfied with their schedule. In general, patrol level managers agree that police officers are very satisfied with peace teams' work schedule. But they also agreed that the 12/24 schedule is required to meet organizational demands since the majority of peace team officers do not work at night.

Managers expressed the view that both schedule have advantages and disadvantages. The 12/24 schedule is preferred as it has more leisure time between shifts. It is also said that this schedule causes dissatisfaction and prevents officers from having regular social and family lives. On the other hand, officers working in peace teams like their schedule, since it provides more nights with their families, has eight hours shifts, and allows them to work based on work demands. One of the uniform patrol managers stated that it is difficult for managers to monitor officers during working hours with the peace teams' schedule. But no other interviewee mentioned such a disadvantage for the peace teams' schedule.

All interviewed managers believe that the 12/24 schedule causes –to some extent- problems for officers' health, social and family relationships, motivation, and performance. These results correspond with the previous studies on long working hours (Zengin, 1997; Smith et al., 1998; Baycan, 2004; Vila, 2006; Knauth, 2007; Demir, 2008). They provided some recommendations to eliminate the hazards of the 12/24 schedule and to extend the benefits of peace teams' schedule. Although city managers

consider the current work schedules ideal, they indicate the requirements of additional officers and equipment, such as vehicles and motorbikes that would be necessary to change work schedules. Two patrol unit managers support increasing the number of peace teams or setting up a new group within uniform patrol like peace teams to increase officers' satisfaction and service quality. Two alternative schedules are often suggested for uniform patrols by managers. The first one is the 12/36 schedule, which is recommended in the WTC, with 4 groups, and the second one is the 8/24 schedule, which was discussed as an alternative work schedule in the recommendation part of this study.

For better understanding of interviewees' thoughts on work scheduling in general and on current work schedules, seven criteria on work schedules developed by the English police (The Home Office UK Police, 2004) were given to interviewees to rate. In the first column of the table, the average rates of importance of these criteria for interviewees are indicated, from 1 (not important) to 5 (very important). The second column presents managers' ratings based on the extent to which the 12/24 schedule satisfies each of the criteria. The third column presents managers' ratings on the peace teams' schedule from 1 (not satisfied) to 5 (very satisfied).

According to the table, all managers rated the criteria either important or very important (4.45 out of 5). Managers indicated "Good quality of life for officers" (4.83) as the most important criteria and "Minimizes sickness/absenteeism" (3.83) as the least important criteria in terms of work scheduling. These findings can be explained by assuming that although managers give importance to their staff, some of them do not have sufficient information on the hazards of shift work on employees' health. The interviewee who rated "Minimizes sickness/absenteeism" criteria as (1) remarked that "a sick person is sick" and work schedules do not have any effects on officers' health. He believes that

an officer who dislikes his job uses illness as an excuse to escape from duty, therefore it is not only work schedules, but also the job that affects officers' satisfaction and cause absenteeism, not sickness.

City level managers found this criterion slightly more important (4.5) than patrol level managers (4.43). Also peace team managers found this criterion more essential (4.71) than uniform patrol managers (4.19) do. In fact, differences among these groups regarding the importance of this criterion were cause by two managers (number 1 and 4) who rated the "Minimizes sickness/absenteeism" criteria with a (1) and the "Popular with officers" criteria with a (2). Other than those, all ratings were 4 or 5, which indicates a consensus on the importance of these criteria.

In the second and third columns of the table, managers were asked to rate to what extent they were satisfied with the 12/24 schedule and the peace team's schedule based on each criterion. The criteria for which they were most satisfied with for the 12/24 schedule were "popular with officers" (3.33) and "meets all laws and police regulations" (3.33), and the criteria they were least satisfied with was "Minimizes sickness/absenteeism" (1.83). City level managers rated criteria more satisfactory (2.56) than patrol level managers (2.47) for the 12/24 schedule on the whole. Also uniform patrol managers were more satisfied (2.67) with the 12/24 schedule than peace team managers (2.33).

On the other hand, managers found the peace team's schedule more satisfactory (3.85) than the 12/24 schedule (2.50) based on the criteria. The criteria which managers found to be most fulfilled by the peace teams' schedule was "Good quality of life for officers" (4.50), which was selected as the most important criteria by managers. The criteria for which managers were least satisfied with were "Minimizes sickness/absenteeism" (3.33) and "Provides a match with demand" (3.33). City level

managers (4.22) believed more than patrol level managers (3.13) that the peace teams' schedule meets the criteria. Also, uniform patrol managers were less satisfied (3.08) with the peace teams' schedule than peace team managers (4.63). In addition, a general question on schedule satisfaction apart from the criteria was rated by managers. Managers were more satisfied with the peace teams' schedule (3.83) than the 12/24 schedule (1.83).

From these findings, we can conclude that managers are more satisfied with their own unit's schedule than those of other units. For example, peace team managers indicated less satisfaction (2.33) with the 12/24 schedule than uniform patrol managers (2.67), while uniform managers indicated less satisfaction (3.08) with the peace teams' schedule than peace team managers (4.22). But the differences between managers' satisfaction level with the peace teams' schedule (4.22 – 3.08= 1.14) versus the satisfaction level of the 12/24 schedule (2.67 – 2.33= 0.34) were remarkably high. Thus, the ratings revealed that the peace teams' schedule satisfies managers based on the criteria specified more than the 12/24 schedule.

Another remarkable finding was that city level managers have more satisfaction (2.56) with the 12/24 schedule than patrol level managers (2.47), while they were less satisfied (3.13) with the peace teams' schedule than patrol level managers (4.22). They might believe that the peace teams' schedule cannot be implemented without any schedule that covers each hour of the day with a sufficient number of officers. This is realistic, however, because city level managers should take into account not only a unit but the entire department in the staff allocation process. They have indicated low satisfaction with the 12/24 schedule but they also mentioned the need of such a schedule for police services.

4.3. Personnel Demands

4.3.1. Frequency Tables

More than half of the survey participants (61.7%) work in region A, 26% work in region B, and the rest (about 12.3%) work in region C. This is consistent with the rate of distribution of officers working in the Public Order Department, which are 55 percent, 31 percent, and 14 percent respectively.

Table 17. Frequency Table of Region Variable

Regions	Frequency	Percent
Region A	327	61.7
Region B	138	26.0
Region C	65	12.3
Total	**530**	**100**

The majority of participants are male (96.4%) and there are only 19 female officers (3.6%) in the sample. Also the majority of participants are line officers (99.2%) and 4 lower managers (0.8%) out of 530 participants. Although these results are consistent with the current rates of females and managers in the department, these two variables were eliminated to discuss during data analyze.

Table 18. Frequency Table of Rank Variable

Rank	Frequency	Percent
Line officer	526	99.2
Lower management	4	.8
Total	**530**	**100**

Table 19. Frequency Table of Gender Variable

Gender	Frequency	Percent
Female	19	3.6
Male	511	96.4
Total	**530**	**100**

More than 70 percent of the participants are between 31 and 40 years old. Only 2 percent are under 25 years old and 5 percent are over 41 years old. Since the number of officers under 25 and over 41 is relatively lower than those in other age groups, the age variable is analyzed in three groups: under 30, 31-35, and over 36 years old.

Table 20. Frequency Tables of Age Variable

Age	Frequency	Percent
<25 years	11	2.1
25-30 years	107	20.3
31-35 years	180	34.1
36-40 years	203	38.4
>41 years	27	5.1
Total	**528**	**100**

Grouped Age	Frequency	Percent
<30 years	118	22.3
31-35 years	180	34.0
>36 years	230	43.4
Total	**528**	**100**

The survey asked about marital status since it was an essential factor in the literature. The results revealed that there is no equal distribution among responses. Therefore, widowed officers and divorced officers were grouped together with single ones.

Table 21. Frequency Table of Marital Status Variable

Marital Status	Frequency	Percent
Single	110	20.8
Married	420	79.2
Total	**530**	**100**

Number in household was found to have a wide range, but officers who have a household size of 4 or more were top coded as "+4 in Household". Among participants, 18.9 percent of officers have no household members other than themselves and most have two (22.6%) or three (29.4%) household members other than themselves. Officers with 4 or more household members make up 17.9 percent of the total numbers of participant.

Table 22. Frequency Table of Number in Household Variable

Number in household	Frequency	Percent
None	100	18.9
1 in Household	58	10.9
2 in Household	120	22.6
3 in Household	156	29.4
+4 in Household	95	17.9
Total	**529**	**100**

There were 382 uniform officers (72.1%) who participated in the survey, and 148 peace team officers (27.9%) who completed the survey. These rates are consistent with the rates of the study's population (83% and 16%) and sample (79% and 21%).

Table 23. Frequency Table of Units

Unit	Frequency	Percent
Uniform Patrol	382	72.1
Peace Teams	148	27.9
Total	**530**	**100**

The majority of officers had worked in their units for less than 3 years (about 60%) and 30 percent of them had worked between 3 and 6 years. The rest had worked in their units between 6 and 12 years. A small number, approximately 2 percent, had worked as officers for more than 12 years. The percentage of officers with more than 6 years of service was found to be very low, therefore analysis of the impact of seniority in the unit

was conducted within three groups: officers who had worked in their units less than 3 years, 3-6 years, and more than 6 years.

Table 24. Frequency Table of Seniority Variable

Seniority in the Unit	Frequency	Percent
<3 years	319	60.2
3-6 years	165	31.1
6-9 years	21	4.0
9-12 years	13	2.5
> 12 years	12	2.3
Total	**530**	**100**

Grouped Seniority in the Unit	Frequency	Percent
<3 years	319	60.2
3-6 years	165	31.1
>6 years	46	8.7
Total	**530**	**100**

Mode of transport used by officers to go to/from work was recoded since some officers indicated more than one transportation method. Public transportation was the most commonly used method among the officers (81.7%) while others traveled by foot (5.1%), private car (2.8%), service buses (1.5%), and other mode of transportation (8.9%). Officers who commuted to/from work by foot and private car were grouped together, as were those who used public transportation and service buses.

Table 25. Frequency of Mode of Transport Variable

Mode of transport	Frequency	Percent
By Foot	27	5.1
Private Car	15	2.8
Public transportation	433	81.7
Service Bus	8	1.5
Other mode of transportation	47	8.9
Total	**530**	**100**

Grouped Mode of transport	Frequency	Percent
By Foot or Private Car	42	7.9
Public or Service Buses	441	83.2
Other mode of transportation	47	8.9
Total	**530**	**100**

For the majority of officers, the time spent traveling to/from work is between 20-40 minutes (34.5%), followed by 60-80 minutes (26.6%), 40-60 minutes (22.3%), 0-20 minutes (10.6%) and 80 minutes and more (5.1%). This is an expected result because in general, police headquarters are located close to the city centers and officers tend to live around the city centers in Turkey. Also travel time is taken into account when assigning officers to a region and is used an important factor for officers when finding accommodation. Again, due to low representation of officers with commutes over 80 minutes, these officers were grouped with officers whose travel time is between 60 and 80 minutes.

Table 26. Frequency of Time of Travel Variable

Time of Travel	Frequency	Percent
0-20 min.	56	10.6
20-40 min.	183	34.5
40-60 min.	118	22.3
60-80 min.	141	26.6
>80 min.	27	5.1
Total	**530**	**100**

Grouped Time of Travel	Frequency	Percent
0-20 min.	56	10.6
20-40 min.	183	34.5
40-60 min.	118	22.3
>60 min.	168	31.7
Total	**530**	**100**

The majority of officers had worked in the current schedule less than 3 years (about 50%) and 24.5 percent of them had worked between 3 and 6 years. About a quarter of officers had worked in the schedule more than 6 years.

Table 27. Frequency of Time Worked in the Current Schedule

Time Worked in the Current Schedule	Frequency	Percent
<3 years	257	48.5
3-6 years	130	24.5
6-9 years	28	5.3
9-12 years	44	8.3
> 12 years	71	13.4
Total	**530**	**100**

On the other hand, most of the participating officers had worked between 10 and 15 years in any schedule (39.6%). The second biggest portion of officers had worked less than 5 years in any schedule. About 16 percent of the officers had been working more than 15 years in a schedule.

Table 28. Frequency of Time Worked in any Schedule

Time Worked in any Schedule	Frequency	Percent
<5 years	147	27.7
5-10 years	76	14.3
10-15 years	210	39.6
>15 years	85	16.0
Total	**530**	**100**

The dependent variables, schedule satisfaction and schedule fit, were created in SPSS by summing the results of the questions of the schedule satisfaction scale (questions 13 to 19) and the schedule fit scale (questions 20 to 24). The schedule satisfaction variable had values between 6 and 30, with a range of 24, and the mean of the schedule satisfaction variable was 17.05. The schedule fit variable had values between 5 and 25, with a range of 20, and the mean of the schedule fit variable was 13.99. The reliability tests revealed that Cronbach's alpha for schedule satisfaction was 0.89 and for schedule fit was 0.84.

4.3.2. Survey Analysis

The survey was used to answer five sub-questions, "Are there any significant relationships between personal schedule satisfaction/fit and characteristics of the area of responsibility?", "Are there any significant relationships between schedule satisfaction/fit and type of patrol unit?" "Are there any significant relationships between schedule satisfaction/fit and characteristics of officer?" "Are there any significant relationships

between schedule fit and schedule satisfaction?" and "Do regional and unit based differences affect the relationships between schedule fit and schedule satisfaction?" In this part of the study, the findings on these questions are presented by patrol unit, since each unit, uniform patrol and peace team works with a different schedule.

a- Relationships between Personal Schedule Satisfaction/Fit and Characteristics of the Area of Responsibility

Chi-Square analyses were conducted to test the first hypothesis that there are significant relationships between personal schedule satisfaction/fit and characteristics of the area of responsibility. The findings are presented by each variable, schedule satisfaction and schedule fit for patrol units.

Schedule Satisfaction

For uniform patrol, the Chi-Square tests revealed no significant relationships between personal schedule satisfaction and characteristics of the area of responsibility ($p=.062$), while for peace teams, the Chi-Square tests yielded a more significant relationship between personal schedule satisfaction and characteristics of regions ($p=.052$). The level of schedule satisfaction of uniform patrol officers was found similar regardless of regional differences, and the majority of officers were dissatisfied with their schedule (Region A-41.3%, region B-48.5%, and region C-52.8%). Conversely, the level of schedule satisfaction of peace team officers was high, regardless of region (73.2%, 74.4%, and 41.7% respectively), but only officers working in region C were less satisfied than other officers, which made slight differences within this unit.

Table 29. Level of Schedule Satisfaction Regions Crosstabulation

	Region					
	Region A		**Region B**		**Region C**	
	Uniform Patrol	Peace Team	Uniform Patrol	Peace Team	Uniform Patrol	Peace Team
Low Satisfaction	95	4	48	3	28	0
	41.3%	4.1%	48.5%	7.7%	52.8%	.0%
Medium Satisfaction	92	22	39	7	23	7
	40.0%	22.7%	39.4%	17.9%	43.4%	58.3%
High Satisfaction	43	71	12	29	2	5
	18.7%	73.2%	12.1%	74.4%	3.8%	41.7%

Chi-Square: Uni. Patrol: 8.973, df: 4, p= .062, **Peace Teams**: 9.415, df: 4, p= .052

As shown in Table 28, the level of schedule satisfaction among uniform patrol officers was found to be very low in all regions. For the uniform patrols, the first null hypothesis was not rejected since there was no significant relationship between personal schedule satisfaction and the characteristics of the area of responsibility. However, the level of schedule satisfaction was observed to be lower in urban areas with higher crime rates compared to the rural area with low crime rates. Officers working in region A (18.7%) and B (12.1%), the urban areas with the highest crime rates, were more satisfied than officers working in region C (3.8%). Officers working in region C, a rural area with the lowest crime rates, were less satisfied (52.8%) with their schedule than officers working in other regions (41.3% and 48.7%).

The level of schedule satisfaction of peace team officers was very high in every region. The value of alpha level was 0.052, so, the first null hypothesis was not rejected at the .05 level since there was no significant relationship between peace team officers' schedule satisfaction and the characteristics of the area of responsibility. On the other hand, there was a significant relationship and the hypothesis was rejected at the .10 level. The level of schedule satisfaction was lower in the rural area with low crime rates than in the urban areas with higher crime rates. Over 70% of officers working in region A and

region B, the urban areas with high crime rates, were satisfied with their schedule, while only 41.7 percent of officers working in region C, a rural area with the lowest crime rates, were satisfied with their schedule.

These findings suggest that in Izmir patrol units, regional differences slightly affected police officers' schedule satisfaction. Police officers in urban areas indicated a higher degree of s satisfaction than officers in rural areas, despite the higher crime rates and likely higher workload. This finding that officers working in urbanized areas with high crime rates were more satisfied than officers working in rural areas with low crime rates may be explained by their perception that their jobs are meaningful and feeling a sense of achievement.

Schedule Fit

When comparing the schedule fit level, for uniform patrol, the Chi-Square tests indicated a significant relationship between personal schedule fit and characteristics of regions ($p=.033$). On the other hand, there were no significant relationships between peace team officers' personal schedule fit and characteristics of regions ($p=.316$). Therefore, we reject the first null hypothesis for uniform patrol, but we do not reject the null hypothesis for peace teams. That means there was a significant relationship between uniform patrol officers' personal schedule fit and characteristics of regions, but there was no significant relationship between peace team officers' personal schedule fit and characteristics of regions. Unlike the relationship between schedule satisfaction and regional characteristics, the relationships between the degree of schedule fit and regional characteristics were different in each region.

Table 30. Level of Schedule Fit Regions Crosstabulation

	Region					
	Region A		**Region B**		**Region C**	
	Uniform Patrol	Peace Team	Uniform Patrol	Peace Team	Uniform Patrol	Peace Team
Low Fit	104	13	42	3	33	1
	45.2%	13.4%	42.4%	7.7%	62.3%	8.3%
Medium Fit	86	30	46	12	17	7
	37.4%	30.9%	46.5%	30.8%	32.1%	58.3%
High Fit	40	54	11	24	3	4
	17.4%	55.7%	11.1%	61.5%	5.7%	33.3%

Chi-Square: Uni. Patrol: 10.509, df: 4, p= .033, **Peace Teams**: 4.734, df: 4, p= .316

Uniform patrol officers working in regions A and B were found to have a low fit of about 40 percent, while the fit was 62 percent in region C. In region B, 46.5 percent of uniform patrol officers expressed a medium degree of fit with their schedule, while around 35 percent of officers working in regions A and C reported the same level of fit. Officers working in region A were more likely to declare a high degree of fit with their schedule (17.4%), while those in region B (11.1%) and region C (5.7%) stated less fit. Noticeably, the differences among regions came from officers working in region B and region C. The differences that were found in region B cannot be explained. The differences between officers working in region C on the one hand and officers working in regions A and B on the other can be explained by having less police work, which may causes officers to feel useless and to consider time spent working ineffective.

Similar to the relationships between schedule satisfaction of peace team officers and regional characteristics, the relationships between the degree of peace team officers' schedule fit and regional characteristics were not significantly related. Therefore, we do not reject the first hypothesis that there are significant relationships between personal schedule fit and the characteristics of the area of responsibility. Peace team officers,

however, were more likely to express high schedule fit (55.7% in region A and 61.5% region B) in urban areas than officers working in region C (33.3%).

b- Relationships between Schedule Satisfaction/Fit and Type of Patrol Unit

Based on unit, a very significant relationship was found (p=.00). The majority of peace team officers (70.9%) expressed their schedule satisfaction degree as high, while only 14.9 percent of uniform patrol officers were highly satisfied. Supporting this result, very few peace team officers (4.7%) were found to have a low level of satisfaction compared to uniform patrol officers (44.8%). From these results, we reject the null hypothesis that there is no significant relationship between personal schedule satisfaction and type of patrol unit. Therefore, we conclude that there is a significant relationship between personal schedule satisfaction and type of patrol unit.

Table 31. Level of Schedule Satisfaction Units Crosstabulation

	Units		Total
	Uniform Patrol	**Peace Teams**	
Low Satisfaction	171	7	178
	44.8%	4.7%	33.6%
Medium Satisfaction	154	36	190
	40.3%	24.3%	35.8%
High Satisfaction	57	105	162
	14.9%	70.9%	30.6%

Chi-Square: 1.681, df: 2, p= .00

It is clear that the work schedule of peace teams (a flexible and daily 8 hour schedule) makes officers happier. The distinction between the degree of schedule satisfaction of peace team officers and satisfaction of uniform patrols was remarkable. These results are believed to be associated with the flexibility and fewer night shifts of peace teams' schedule.

Another analysis was conducted to measure the relationships between the degree of schedule fit and type of patrol unit. The Chi-Square test indicated a significant relationship (p=.00). According to the below table, peace team officers were more likely to report a high fit (55.4) with their schedule compared to uniform patrol officers, only 14.1 percent of whom reported a high fit. Conversely, uniform patrol officers were more likely to express a low fit (46.9%) with the 12/24 work schedule, while only 11.5 percent of peace team officers indicated a low fit with their work time arrangement. In terms of schedule fit, the second null hypothesis was rejected and a relationship between personal schedule fit and type of patrol unit observed.

Table 32. Level of Schedule Fit Units Crosstabulation

	Units		**Total**
	Uniform Patrol	**Peace Teams**	
Low Fit	179	17	196
	46.9%	11.5%	37.0%
Medium Fit	149	49	198
	39.0%	33.1%	37.4%
High Fit	54	82	136
	14.1%	55.4%	25.7%

Chi-Square: 1.079, df: 2, p= .00

Similar to the findings of schedule satisfaction, the schedule fit results reveal that peace team officers believed that their flexible work schedule fulfills their personal and social time arrangements. On the other hand, uniform patrol officers reported that the 12/24 schedule makes it difficult for them to organize personal and social activities. In point of fact, officers working the 12/24 schedule have difficulties arranging such activities or friend/family visits after night shifts and before day shifts; they only have a chance to use leisure time at nights, after day shifts.

c- Relationships between Schedule Satisfaction/Fit and Characteristics of Officer

The relationships between schedule satisfaction/fit and characteristics of officers were tested by conducting several Chi-Square tests. The characteristics of officers used in this study were age, gender, rank, marital status, number in household, seniority, seniority in unit, mode of transport, duration of travel, duration of work in current schedule, and duration of work in any schedule. Since the researcher discovered chi-square table cells with expected frequencies of less than 5, categories of characteristics were combined to increase the expected frequencies and validity of tests. The below mentioned categories were combined: time of travel variable, "60-80 minutes" and "more than 80 minutes"; age variable, "younger than 25 years"-"25-30 years" and "36-40 years"-"over 41 years"; seniority variable, "15-20 years" and "over 20 years"; number in household variable "4", "5", and "+6 in household"; marital status variable, "widowed", "divorced", and "single"; seniority in the unit variable, "6-9 years", "9-11 years", and "over than 12 years"; travel method variable, "by foot"- "private car" and "public transportation"-"service bus"; time worked any schedule variable, "15-20 years" and "over 20 years." In addition to that the levels of schedule satisfaction and schedule fit were decreased from three (low, medium, and high) to two (low and high) to increase the validity of the test. Analyses were conducted within each unit and presented separately.

Analyses of uniform patrol officers' schedule satisfaction by their characteristics revealed that gender, rank, marital status, seniority in unit, mode of transport, duration of travel, duration of work in current schedule, and duration of work in any schedule did not have significant relationships with officers' schedule satisfaction. Therefore, we do not reject the null hypothesis concerning the lack of a relationship between schedule satisfaction and uniform patrol officer characteristics. Gender and rank variables were not

discussed since the majority of participants were male (96.4%) and constables (99.2%). A few women and ranking officers work in the Department because of its structure and the police services that this Department deals with. Although no significant relationships were found, the findings listed below were remarkable.

Concerning those who were less satisfied with their schedule there were more:

- single officers (50.5%) than married officers (43%),
- uniform patrol officers with less than 3 years seniority in the unit (47.2%) than officers who had worked more in the unit,
- officers who used public transport and service buses (46.8%) than other modes of transports,
- officers traveling more than 60 minutes (49.6%) than officers traveling less, and
- officers who worked 3 years or fewer in the current schedule (50.6%) than officers who had worked more.

There were significant relationships between the variables of age, seniority, number in household and uniform patrol officers' schedule satisfaction. The Chi-Square test indicated a significant relationship between age and schedule satisfaction ($p=.033$). Thus, we reject the null hypothesis and accept a significant relationship between uniform patrol officers' schedule satisfaction and their age. Uniform patrol officers less than 25 years old were the least satisfied group (57.4%), followed by those in the over 36 years old group (44.5%). On the other hand, officers in the same group were more likely to be highly satisfied (18.2%) with their schedule, while only 8.5 percent of officers who are younger than 25 were satisfied with their schedule.

Table 33. Uniform Patrol Officers' Schedule Satisfaction by Age

	Age			Total
	<25 years	**31-35 years**	**>36 years**	
Low Satisfaction	54	49	66	169
	57.4%	38.6%	41.5%	44.5%
Medium Satisfaction	32	58	64	154
	34.0%	45.7%	40.3%	40.5%
High Satisfaction	8	20	29	57
	8.5%	15.7%	18.2%	15.0%

Chi-Square: 10.468, df: 4, p= .033

These findings suggest that younger officers (under 30) were less satisfied with their schedule than their older counterparts. Officers over 36 years old were more likely to express high satisfaction with their schedule. Older officers were used to working more difficult schedules, such as the 12/12 schedule, and therefore these results were expected. Conversely, these results imply that young officers demand new and better schedules.

Schedule satisfaction by seniority was tested. Although no significant relationship (p=.057) was observed at the .05 level, and the null hypothesis was not rejected, there is some evidence that officers with less seniority were less satisfied with their schedule than senior officers. Uniform patrol officers whose seniority was less than 5 years were more likely to express a low degree of schedule satisfaction (56.2%), while officers with more than 15 years seniority were more likely to be very satisfied (22.4%) than other officers.

Table 34. Uniform Patrol Officers' Schedule Satisfaction by Seniority

	Seniority				
	<5 years	**5-10 years**	**10-15 years**	**>15 years**	**Total**
Low Satisfaction	54	22	63	32	171
	56.2%	45.8%	41.2%	37.6%	44.8%
Medium Satisfaction	34	20	66	34	154
	35.4%	41.7%	43.1%	40%	40.3%
High Satisfaction	8	6	24	19	57
	8.3%	12.5%	15.7%	22.4%	14.9%

Chi-Square: 11.328, df: 6, p= .079

These findings suggest similar results to the test results of schedule satisfaction by age. In fact, since officers' seniority is closely associated with their age, officers with less seniority indicated lower schedule satisfaction than officers with higher seniority. The reason might be the same that senior officers were used to working schedules more difficult than the 12/24 schedule. Another reason might be the fact that senior officers are the ones who have decided to stay on the job with these work conditions and with certain schedules.

The last characteristic of uniform patrol officers that was found significantly related (p=.004) to schedule satisfaction is number in household. The second null hypothesis in terms of household size was rejected since there was a significant relationship with uniform patrol officers' schedule satisfaction. Officers with 0 or 1 other household member(s) expressed less schedule satisfaction (44.3% and 57.5% respectively) than their colleagues with more household members. Officers with more than 4 household members were more likely to indicate high satisfaction (31.2%) with their schedule.

Table 35. Uniform Patrol Officers' Schedule Satisfaction by Number in Household

	Number in Household					Total
	None	**1**	**2**	**3**	**4**	
Low Satisfaction	35	23	40	44	28	170
	44.3%	57.5%	44.0%	41.1%	43.8%	44.6%
Medium Satisfaction	38	14	41	45	16	154
	48.1%	35.0%	45.1%	42.1%	25.9%	40.4%
High Satisfaction	6	3	10	18	20	57
	7.6%	7.5%	11.0%	16.8%	31.2%	15.0%

Chi-Square: 24.477, df: 8, p= .002

Although the researcher was expecting more household members to cause more conflict between an officer's working hours and family life, as shown in above table, the increase in number of household members positively affects the officers' schedule satisfaction. Assuming that the majority of household members were officers' children,

these results can be explained by taking into account that the number of children is correlated to officers' age and seniority, which caused the same impact on the degree of satisfaction in the previous tests.

Based on schedule fit, uniform patrol officers were more likely to express low schedule fit and there were no significant relationships between schedule fit and characteristics of officers. Therefore, the null hypothesis was not rejected, but the test on time worked in the current schedule yielded a significant relationship (p=.052) with schedule fit at the .10 significance level. Uniform patrol officers who had worked between 10 to 15 years with the current schedule were more likely to indicate medium schedule fit (71.4%) and expressed the lowest level of both fit and high fit with schedules. There were no differences among other groups based on the level of schedule fit.

Table 36. Uniform Patrol Officers' Schedule Fit by Time Worked in the Current Schedule

	Time Worked Current Schedule					
	<5 years	**5-10 years**	**10-15 years**	**15-20 years**	**>20 years**	**Total**
Low Fit	78	37	7	19	38	179
	48.8%	46.2%	25.0%	44.2%	53.5%	46.9%
Medium Fit	58	29	20	18	24	149
	36.2%	36.2%	71.4%	41.9%	33.8%	39.0%
High Fit	24	14	1	6	9	54
	15.0%	17.5%	3.6%	14.0%	12.7%	14.1%

Chi-Square: 15.362, df: 8, p= .052

In this part of the study, characteristics of peace team officers are examined to determine their impact on schedule satisfaction and schedule fit. Although only one variable, time of travel, was found significantly related to schedule satisfaction, the following results were remarkable. Even though peace team officers were more likely to indicate a high degree of schedule satisfaction, peace team officers who were between 31 and 35 years old indicates higher satisfaction than other age groups (73.6%). Also officers who were traveling by public and service buses expressed lower schedule satisfaction

(5.5%) than other groups. Although public and service buses might not be equal in every region, officers using public and service buses spend probably more time to/from home and might have more difficulties than officers using other mode of transportation. On the other hand, officers who have only one household were more satisfied (72.2%) with their schedule while officers with three households were less satisfied from their schedule. Again gender and rank variables were not discussed for peace team officers since the majority of participants were male (96.4%) and constables (99.2%).

During analysis of peace teams' characteristics, the researcher discovered that there were only three variables that significantly affect officers' schedule satisfaction and schedule fit. The Chi-Square tests yield significant results for the relationships between (1) time of travel and schedule satisfaction, (2) time of travel and schedule fit, and (3) the number of household members and schedule fit. Since all three result tables of the chi-square tests have cells with expected frequencies less than 5, first, two factors, "60-80 minutes" and "more than 80 minutes," were combined to increase expected frequencies. Since three categories for level of schedule satisfaction and schedule fit were not enough, the level of schedule satisfaction and schedule fit was decreased from three (low, medium, and high) to two (low and high) to increase the validity of the test. This time, only the time of travel variable was found significantly related to both dependent variables. These results are presented below.

Table 37. Peace Team Officers' Schedule Satisfaction by Time of Travel

	Time of Travel				
	0-20 min.	**20-40 min.**	**40-60 min.**	**>60 min.**	**Total**
Low Satisfaction	1	6	3	19	29
	7.7%	12.0%	10.0%	34.5%	19.6%
High Satisfaction	12	44	27	36	119
	92.3%	88.0%	90.0%	65.5%	80.4%

Chi-Square: 12.555, df: 3, p= .006

Time of travel was the only factor that had a significant relationship (p=.006) between schedule satisfaction and characteristics of peace team officers. Therefore, we do not reject the null hypothesis that there are no relationships between schedule satisfaction and characteristics of peace team officers, except for the time of travel factor. Officers who spent more than one hour commuting to/from home to work indicated less satisfaction (9.1%) more frequently than officers who were traveling less (0-20 minutes 7.7%, 20-40 minutes 12%, 40-60 minutes 10%). Although no significant relationship was found between characteristics of uniform patrol officers and schedule satisfaction, uniform patrol officers who travel more than one hour also expressed less schedule satisfaction than officers traveling less. Likewise, officers who commuted less than 20 minutes were more likely to indicate high satisfaction (92.3%) with their schedule and officers who commuted more than 60 minutes were more likely to express low satisfaction than others.

The Chi-Square tests on the relationship between schedule fit and the characteristics of peace team officers had significant relationship for only one factor, time of travel. However, peace team officers were more likely to indicate a high degree of fit with their schedule. Since there are no significant differences between schedule fit and the characteristics of peace team officers (age (p=.583), marital status (p=.708), number in household (p= .124), seniority (p=.363), seniority in unit (p=.664), mode of transportation (p=.474), duration of work in current schedule (p=.685), and duration of work in any schedule (p=.509), the null hypothesis was not rejected.

Table 38. Peace Team Officers' Schedule Fit by Time of Travel

	Time of Travel				
	0-20 min.	**20-40 min.**	**40-60 min.**	**>60 min.**	**Total**
Low Fit	0	3	4	15	22
	.0%	6.0%	13.3%	27.3%	14.9%
High Fit	13	47	26	40	126
	100.0%	94.0%	86.7%	72.7%	85.1%

Chi-Square: 12.121, df: 3, p= .007

Another variable that was found significantly related at the .05 level to schedule fit (p=.019) was time of travel. Parallel to the results of the previous tests, officers with less travel time were more likely to indicate a high degree of schedule fit (0-20 minutes-69.2% and 20-40 minutes-68%), while officers who commute more to/from work were more likely to express a low degree of schedule fit (40-60 minutes-10% and more than 60 minutes-20%) than other officers. Correspondingly, officers who travel more than 60 minutes indicated the least high fit of all other groups of officers. Therefore, it is concluded that time of travel is the only factor that has a significant relationship with peace team officers' characteristics and their schedule satisfaction and fit. In other words, officers' schedule satisfaction and fit can significantly increase or decrease according to commute time to/from work. The lesser the time of travel, the more satisfaction or fit would possibly emerge.

d- Relationships between Schedule Fit and Schedule Satisfaction

The fourth hypothesis that was tested by data collected from the survey was "Are there any significant relationships between schedule fit and schedule satisfaction?" It was hypnotized that the better a schedule fit to the characteristics of regions and persons, the more schedule satisfaction would emerge. Linear regression tests were conducted to measure the relationship between schedule fit and schedule satisfaction. Schedule fit was found to be significantly related to schedule satisfaction (p=.000) and the beta coefficient

was found to be .769. Therefore, we reject the null hypothesis that there is no significant relationship between schedule fit and schedule satisfaction.

Table 39. Schedule Fit and Schedule Satisfaction Regression Test Tables

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.769[a]	.592	.591	4.401

Coefficients [a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.869	.513		7.537	.000
	Schedule Fit	.942	.034	.769	27.668	.000

In addition, an adjusted R square (R^2) of .592 was found, which means schedule fit explains 59.2 percent of the variation in schedule satisfaction. The unstandardized regression coefficient is very high at .942, which means that a one unit change in schedule fit causes a .942 unit change in schedule satisfaction. This result supports the theoretical framework of the present study, which posits that the better the schedule fit, the more schedule satisfaction emerges. The next tests were conducted to measure whether regional characteristics and different units impact the relationship between schedule fit and schedule satisfaction. Linear regression tests between schedule fit and schedule satisfaction were run separately for each region and each unit, but results are presented for all regions and all units together.

e- The Effects of Regional and Unit Based Differences on Relationships between Schedule Fit and Schedule Satisfaction

Based on region, there are significant relationships between schedule fit and schedule satisfaction in all regions (p= .000 in all regions). Thus, we reject the null hypothesis that there is no significant relationship between schedule fit and schedule

satisfaction in all regions. The highest correlation coefficient was observed in region C (.808), while it is .771 in region A and .719 in region B.

Table 40. Schedule Fit and Schedule Satisfaction Regression Test Tables by Region

Model Summary				
Regions	R	R Square	Adjusted R Square	Std. Error of the Estimate
Region A	.771[a]	.594	.593	4.444
Region B	.719[a]	.517	.513	4.557
Region C	.808 [a]	.653	.647	4.263

Coefficients [a]						
		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
Region A	(Constant)	3.448	.690		4.999	.000
	SchFit	.956	.046	.771	20.677	.000
Region B	(Constant)	4.393	1.166		3.766	.000
	SchFit	.916	.081	.719	11.249	.000
Region C	(Constant)	3.605	1.828		1.972	.054
	SchFit	1.010	.102	.808	9.898	.000

A consistent result was found when we compare the adjusted R square (R^2), since in region C, schedule fit explains 65.3 percent of the variation in schedule satisfaction, while it explains 59.4 percent in region A and 51.7 in region B. In addition, the unstandardized regression coefficients are very high in all regions. In region A, it is .956, which means a one unit change in schedule fit causes a .956 unit change in schedule satisfaction. In region B, the unstandardized regression coefficient is .916 and it is 1.010 in region C. These results reveal that in region C, officers' schedule fit impacts their schedule satisfaction more than that of officers working in region A and B. Another result from these findings is that schedule satisfaction of officers working in the rural area (region C) increased by the degree of schedule fit more than other officers working in urban areas (regions A and B).

Based on patrol unit, there are significant relationships between schedule fit and schedule satisfaction in both units (p= .000 for each unit). Therefore, we reject the null hypothesis that there is no significant relationship between schedule fit and schedule satisfaction among units. A beta coefficient of .669 was found for uniform patrol and of .753 for peace teams. The adjusted R square (R^2) revealed that for uniform patrol, schedule fit explains 44.7 percent of the variation in schedule satisfaction and 56.7 percent for peace teams.

Table 41. Schedule Fit and Schedule Satisfaction Regression Test Tables by Unit

Model Summary				
Units	R	R Square	Adjusted R Square	Std. Error of the Estimate
Uniform Patrol	.669 [a]	.447	.445	4.339
Peace Team	.753[a]	.567	.564	3.563

Coefficients [a]						
		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
Uniform Patrol	(Constant)	5.000	.594		8.415	.000
	SchFit	.783	.045	.669	17.523	.000
Peace Team	(Constant)	8.020	1.138		7.050	.000
	SchFit	.832	.060	.753	13.835	.000

Furthermore the unstandardized regression coefficients in both units are very high. For uniform patrol, the regression equation (Y=alpha + BX) became Y=5.000 + 0.783*X. This means that for a one unit increase in the level of schedule fit, the level of schedule satisfaction increases an additional .783 unit. There is an increase of .832 units in level of schedule satisfaction with a one unit increase in the level of schedule fit for peace teams. It is clear that schedule fit affects peace team officers' schedule satisfaction more than uniform patrol officers' satisfaction.

DISCUSSION, POLICY IMPLICATIONS AND CONCLUSIONS

Discussion

In this part of the study, findings collected from all three data collection methods, secondary data, survey, and interviews, are discussed based on literature. To make it easier to follow, the discussion is organized into two sections, discussion on organizational demands and discussion on personnel demands.

Discussion on Organizational Demands

Organizational demands were examined by collecting secondary data and by analyzing and interpreting literature. Findings were compared and discussed based on the independent variables of legality, efficiency, flexibility, and manageability. The legality variable was measured by examining national regulations and comparing the current schedules' dimensions with international standards, including the ILO and the European Work Time Directive standards. Based on national regulations, the current work schedules comply with the existing national regulations.

The current work schedules, the 12/24 schedule and the peace teams' schedule, were developed in a circular, the WTC, based on a law (the GOA) as required by the

Constitution. However, arranging the details of work schedules with a Circular and some of its provisions was observed to cause problems.

First, in GOA Article 99, after setting 40 hours as a weekly working limit for governmental officers, as an exception, it is mentioned that "…work time arrangements should not include weekends, unless working hours are arranged by a different by-law or regulation in order to fulfill the agencies' service requirements" (GOA, 1965, Article 99). Therefore, the law requires those agencies which provide 24 hour public services should arrange their working hours with a "by-law or regulation." In practice, arranging working hours with a regulation might possibly provide better protection of officers' rights. This is consistent with the recommendation in the report of the 9 Eylul University on police work schedule in the TNP (Ozturk and Sancaktar, 2001). In fact, it can be expected that a Regulation, as a main source of legal norms (while circulars are not), can help the implication process of working hours.

Second, the definition of an extreme situation in the WTC is very general and subjective for managers to determine when they really need more manpower and when they need to change work schedules from normal schedules (12/24 and 12/36) to the 12/12 schedule (WTC, 1995). This definitional problem causes officers to work more with the same overtime payment and increases officers' complaints about work schedules. Along with a new regulation, the definition of an extreme situation and the conditions for changing the schedule should be clearly described.

The third major problem of the WTC was observed in relation to overtime arrangements. It is stated in Article 4 that working hours can be extended not more than one fourth (¼) of a shift length in extreme situations or when managers delay shift changes due to service demands. But these extended overtime hours have to be

compensated or replaced with rest time (WTC, 1995, Article 4). The overtime hours should be arranged in detail and monitored by an authority to protect officers.

The fourth, last, and most critical problem caused by the WTC relates to overtime payment. Although Article 178/A of the GOA requires overtime payments for more than 40 work hours per week, there is no arrangement on this issue in the WTC. TNP officers get a fixed overtime payment –which is slightly different among units—in addition to their salary, regardless of actual overtime work (Ulkemen 2008). This additional pay was set in the Security Service Act, 3201 (SSA) with the additional Article 21 in 1993. With this article, police officers began to receive overtime payment, but this payment creates injustice since it is paid to all officers, regardless of who works more or less. Because of this payment from the central government, managers do not and cannot control or arrange overtime payments. Managers are not responsible for using officers efficiently based on their overtime payment. In other words, managers are responsible for providing the best services by using officers, but they are not accountable for officers' overtime payment.

From another point of view, Cevik remarks that "the higher managers use their human resources without any limitation" (Cevik, 2006) because of this fixed overtime payment. He suggests that officers become "modern slaves" by mangers who abuse officers' rights (Cevik, 2006). In addition, the fixed overtime is one of the reasons to explanations for the lack of study or developments on working time arrangements in the TNP. In the literature, the majority of studies on police work schedules are conducted to minimize overtime payments by finding an optimum schedule for organizational demands (Stenzel and Buren, 1983, 121; The Home Office UK Police, 2004, 3; Taylor and Huxley, 1989, 903). But in the TNP, since overtime is a fixed cost and it is not a performance

factor for managers, neither administration of the TNP nor researchers are willing to study this issue.

The overtime payment problem is increasingly becoming the subject of court cases. During the present study, another two court decisions were taken on overtime payments. In the first case, a TNP Major sued the TNP in 2005 because of unfair overtime payments. However, his requests to revoke the WTC policy and receive payment for his overtime from the beginning of his work in the TNP were declined with the State Council decision. The Council concluded that this payment, the so called overtime payment, is paid for the importance and difficulties of the job, not to compensate officers' overtime hours, since it has been given regardless of officers' actual extended hours (2009/6677 2005). Therefore, the court declared that TNP officers are not paid for their overtime.

In the second case, police officer Nihat Atilla sued the TNP with the same request and also to revoke the WTC. He, as a shift worker, claimed that having the same amount of overtime payment as bureau officers creates inequity among officers. The officer appealed for an end to these unfair arrangements and sought reimbursement for the difference between what he should have earned in overtime payment and what he has actually earned. According to his calculation, officers who work shifts, work 928 hours more overtime than bureau officers in a year. He believes that he should be paid around $30,000 for the 10,138 overtime hours he has worked since the beginning of his employment (Atilla, 2008). Although the case has not been decided by the State Council, these kinds of complaints might not end unless overtime payment arrangements for TNP officers change.

Regarding the international standards, the current work schedules were compared with the ILO and EU standards. The 12/24 schedule was found incompatible with these international standards. The 12/24 work schedule was determined to comply with only two out of eight internationally accepted standards, those of Minimum Daily Rest and Annual Paid Leave. The findings on the 12/24 schedule revealed that the overtime limit and overtime payments were the most problematic issues for uniform patrol officers. The peace team schedule was observed to be well-matched with these standards. The peace teams' schedule met seven out of eight standards.

Based on the efficiency of current work schedules, the fit level between the number of crimes and the number of officers assigned to each hour of the day was measured. Regional and unit based analyses revealed different correlation scores and the best match was observed in region B (.562). Only in region C and for uniform patrol did changing crime rates and assigned officers not yield any significant relationship. Although the insufficient and inefficient equal allocation method was used for uniform patrols, establishing peace teams and implementing a flexible work schedule was associated with a much better efficiency score (.535).

In general, the number of officers should be re-considered based on the changing job demands for each hour of the day. Instead of using schedules that involve equal staffing for each hour of the day, schedules that enable management to assign different numbers of officers depending on organizational needs should be developed. Equal staffing not only mismatches the demand profile but also negatively affects response times and officer safety. These findings are consistent with previous study findings that equal staffing causes inefficiency (RCMP, 1995). If the number of peace teams increases

or the uniform patrols' schedule changes, a better efficiency score is more likely to be achieved.

The flexibility of current work schedules was analyzed based on organizational and individual flexibility. Organizational flexibility, "meet[ing] the needs of employers, e.g., changing operational times, varying customer and service times" (Costa, 2004, 834), was examined based on crime trends in each region. Although crime trend differences were found based on day of the week and seasons, there were no flexible methods used by uniform patrol, whereas the peace team schedule with its design brings flexibility to the Department. The 12/24 schedule provides an equal number of officers regardless of crime trends, day of the week and seasons. With the peace teams' schedule, on the other hand, managers can arrange different start and ending times, and various numbers of officers depending on demand. Therefore, based on organizational flexibility, the 12/24 schedule was found to be inflexible in terms of meeting organizational demands, while the peace teams' schedule was observed to be more flexible than the 12/24 schedule.

Regarding individual based flexibility, three questions were examined to determine how officers feel about their schedule's flexibility in meeting their needs. Approximately 70 percent of uniform patrol officers and 20 percent of peace team officers, indicated agreement or strong agreement that their work schedule affect family life negatively. Similarly, the same percentage of uniform patrol officers (69.7%) agreed or strongly agreed that their work schedule affects their social life negatively, and only 28.9 percent of peace team officers agreed or strongly agreed with this statement. On the other hand, the majority of peace team officers (56.7%) believe that the schedule does not help to coordinate their plans with other family members' plans and about 30 percent of uniform patrol officers support this statement.

Although flexible working methods such as part-time work, fixed shifts, annualized hours, variable shift arrangements, and working from home are not used in the TNP, the work schedule used by peace teams can be considered as a type of variable shift. According to these results, the peace teams' work schedule is much more flexible in terms of meeting organizational and individual needs by providing variable numbers of patrol and flexible work time arrangements to officers.

Manageability of schedules was measured with a five factor analysis including number of shifts, start and end times, length, rotation, and flexibility. From the comparisons between the 12/24 schedule and the peace teams' schedule, the 12/24 schedule with its fixed shifts (day and night), start and end times, length of shifts, and speed of shift rotation, was found to be an easier schedule for managers to arrange.

Overall, current work schedules partially meet organizational demands including legality, efficiency, flexibility, and manageability. On the legality issue, management is required to make some changes in the regulation of working hours. Specifically, the 12/24 schedule should be abandoned and replaced with a more flexible work schedule. The problem derived from legal regulations on work schedules also affects the efficiency and flexibility factors. Although the peace teams' schedule has a positive impact on the entire working system, the 12/24 schedule is still being used by almost 80% of officers of the Izmir Public Order Department. By relying more on peace teams, the department might enhance effectiveness and efficiency, but this would not help uniform patrol officers working with the 12/24 schedule.

Moreover, peace teams are not enough to fully answer to all changing job demands among hour of the day, day of the week, and season. The uniform patrol unit requires having such flexible arrangements to meet variable crime rates. From the

management point of view, the 12/24 schedule was found to be a very easy schedule to use while the peace team schedule was found difficult to manage. Considering this weakness of the peace teams' schedule with its several benefits, managers can and should minimize management difficulties of this schedule by using computerized work schedulers that are widely used by other police departments. The computerized scheduling software would enable department to save time and personnel cost by enabling management to control human resources more precisely. This will also affect officers' welfare and satisfaction, quality of services and citizen satisfaction with police services.

Discussion on Personnel Demands

In order to examine the fit and satisfaction level of personnel demands**,** a survey was conducted with patrol unit officers in the Izmir Police Department. The data was analyzed using SPSS. Five hypotheses were tested by conducting various Chi-Square and regression tests.

According to these data analyses, the first null hypothesis, which is that no significant relationship exists between officers' schedule satisfaction/fit and characteristics of the regions, was rejected only for the relationship between uniform patrol officers' schedule fit and characteristics of the regions. Although in Izmir patrol units no significant relationship was found between factors, regional differences slightly affected police officers' schedule satisfaction. Officers' schedule dissatisfactions were similar among uniform patrol officers regardless of their regional differences. On the other hand, peace team officers indicated a high level of schedule satisfaction in all regions, but officers working in the rural area (region C) were less satisfied than officers working in urban areas (regions A and B). Based on the schedule fit variable, analyses revealed that there was no relationship between peace team officers' schedule fit and

characteristics of the regions, while uniform patrol officers' schedule fit and characteristics of the regions were significantly correlated. However, peace team officers were more likely to indicate high schedule fit (region A-55.7% and region B-61.5%) in urban areas than officers working in rural area (region C-33.3%). Thus we concluded that having a meaningful job and feeling a sense of achievement are more essential for officers in urbanized regions than working long hours in uncertain conditions when determining schedule fit.

The second null hypothesis that there is no significant relationship between personal schedule satisfaction/fit and type of patrol unit was rejected for both units. Therefore, we concluded that there was a significant relationship between personal schedule satisfaction/fit and type of patrol unit. Uniform patrol officers stated that the 12/24 schedule makes it difficult to organize their individual, family and social activities. On the other hand, the peace teams' schedule makes officers happier and more satisfied than uniform officers. These results are believed to be attributable to its flexibility and fewer night shifts.

The test of the third hypothesis revealed significant relationships only between uniform patrol officers' schedule satisfaction and officers' age and number in household at the .05 level. Also seniority, marital status, and duration of work in any schedule were found significantly related to uniform patrol officers' schedule satisfaction at the .10 level. Other than those characteristics, there were no significant relationships between uniform patrol officers' schedule satisfaction and officers' gender, rank, seniority in unit, mode of transport, duration of travel, and duration of work in current schedule. Thus, we rejected the third null hypothesis and accepted a significant relationship between uniform patrol officers' schedule satisfaction and their age, number in household, seniority, marital

status, and duration of work in any schedule. These findings support the claim that officers under 30 are less satisfied with their schedule than their older counterparts. That might be because of older officers' previous experiences with more difficult work schedules, such as the 12/12 schedule. From a different point of view, young officers' dissatisfaction with the 12/24 schedule can be explained by their demands for a new and better schedule to change their working conditions.

However, the Attraction-Selection-Attrition (ASA) model developed by Schneider (1987) suggests that officers who do not fit into an organization will leave it (Schneider, 1987, 442). There might be a "survivor" effect of longer-term officers having greater satisfaction with the schedule because, presumably, those who cannot deal with this part of police work will leave. But because of the structure of the TNP as a nation-wide and highly centralized agency, in Turkey, police officers cannot leave the job that easily for two main reasons: (1) no other police agencies exist for which they might work (difficulties of finding a job), (2) leaving a police agency generally negatively affects officers' reputations and their esteem in the public. On the other hand, some officers who are dissatisfied with their work conditions, schedule or their unit in general look for a better unit and tend to leave the original unit. Therefore, the ASA model can apply to the TNP among units. This means that TNP officers who do not fit a unit are more likely to leave the unit, not the organization. This might explain the higher schedule satisfaction of older uniform patrol officers compared to their younger counterparts in the Izmir Public Order Department. On the other hand, younger peace team officers were more likely to express high schedule satisfaction and fit than their older colleagues. Also, only the time worked in current work schedule variable was found to be significantly related ($p=.052$) to schedule fit and characteristics of uniform patrol officers at the .10 significance level.

The relationship between characteristics of peace team officers and schedule satisfaction/fit was examined and only time of travel was found to be significantly related at the .05 significance level. Peace team officers who spend more than one hour traveling to work indicated less satisfaction than officers who were traveling less. Correspondingly, uniform patrol officers who travel more than one hour expressed less schedule satisfaction than officers traveling less (47.3% and 60%, respectively). The relationship between schedule fit and characteristics of peace team officers was significant for two factors, number in household and time of travel. Officers were more likely to indicate a high degree of fit with their schedule (55.4%). Interestingly, all peace team officers with 6 or more household members indicated a high degree of fit with their schedule. Similarly to the results of the previous tests, officers with less travel time were more likely to indicate a high degree of schedule fit, while officers who travel more than one hour to work were more likely to express a low degree of schedule fit.

In the analysis of the fourth hypothesis, we rejected the null hypothesis, since there is a significant relationship between schedule fit and schedule satisfaction. Also, a group of regression tests was conducted to test the hypothesis that there are significant relationships between schedule fit and schedule satisfaction based on region and unit. Schedule fit in region C impacts officers' schedule satisfaction more than schedule fit of officers working in region A and B impacts their respective schedule satisfaction. Schedule satisfaction of officers working in the rural area (region C) increased by the degree of schedule fit more than other officers working in urban areas (regions A and B). Based on type of unit, the findings revealed that schedule fit has more of an effect on peace team officers' schedule satisfaction than on uniform patrol officers' satisfaction.

The total results of survey were listed in the following table:

Table 42. Survey Results of the Study based on Unit

	UNIFORM PATROL		PEACE TEAM	
Ind. Var./ Dep. Var.	**Schedule Satisfaction**	**Schedules Fit**	**Schedule Satisfaction**	**Schedules Fit**
CHARACTERISTICS OF REGION	*Low satisfaction in all regions Region C the lowest, Region A the highest satisfaction*	**Region C the lowest (5.7%) and Region A the highest fit (17.4%)**	*High satisfaction in all regions Reg. C the lowest (41.7%) Region B the highest satisfaction (74.4%)*	Region C the lowest (33.3%) and Region B the highest fit (61.5%)
CHARACTERISTICS OF UNIT	**44.8% low, 14.9% high satisfaction**	**46.9% low, 14.1% high fit**	**4.7% low, 70.9% high satisfaction**	**11.5% low, 55.4% high fit**
PERSONNEL **CHARACTERISTICS**				
Gender	ELLIMINATED			
Age	**Under 30 ages the lowest (57%), over 36 ages the highest (18.2%) satisfaction**	over 36 years old the lowest (78**%**), 31-35 the highest (16.5**%**) fit	36-40 the lowest (5.6**%**), 31-35 the highest (73.6**%**) satisfied	31-35 years the lowest (17%), younger than 30 years the highest (69.6%) fit
Rank	ELLIMINATED			
Marital Status	*Singles lower 50.5%, Married higher 17.2% satisfied*	Singles lower 50.5%, Married higher 14.4% fit	Singles the lowest 5.3%, married the highest 72.1% satisfied	married 53.5% and singles 68.4% fit
number in household	**1 household the lowest (57.5%), over 4 household the highest (31.2%) satisfaction**	1 household the lowest (60%), more than 4 household the highest fit (20.3%)	3 household the lowest (8.2%), 1 household the highest satisfaction (72.2%)	**3 household the lowest (33.3%), none household the highest fit (71.4%)**
Seniority	*less than 5 years seniority the lowest (56.2%), over 15 year seniority the highest satisfaction(22.4%)*	Over 15 years seniority have the lowest (49.4%) and the highest fit (16.5%)	5-10 years seniority the lowest (7.7%), 10-15 years seniority the highest satisfaction (75%)	15-20 years seniority the lowest (21.2%), less than 5 years seniority the highest fit (68.2%)
Seniority in the Unit	under 3 years seniority the lowest (47.2%), 3-6 years the highest (18.3%) satisfaction	Less than 3 years the lowest (48.6%) and the highest (15.6%) fit	Less than 3 years the lowest (5.9%), more than 6 years the highest (100%) satisfaction	Less than 3 years the lowest (11.9%), more than 6 years seniority the highest (100%) fit
Travel method	Public and service bus users the lowest 46.8%, multiple vehicle the highest satisfaction (18.4%)	Public and service bus users the lowest 47.8%, multiple vehicle users the highest fit (21.1%)	Public and service bus users the lowest 5.5%, multiple vehicle the highest satisfaction (88.9%)	multiple vehicle the lowest 22.2%, by foot and private car users the highest fit (58.3%)
Time of Travel	More than 60 minutes the lowest (49.6%), 40-60 minutes the highest satisfaction (20.5%)	40-60 minutes the lowest (56.8%), 20-40 minutes the highest fit (14.3%)	**More than 60 min. the lowest (9.1%), Less than 20 minutes the highest satisfaction (92.3%)**	**60-80 minutes the lowest (20%), Less than 20 the highest fit (69.2%)**
Time worked current schedule	Less than 3 years the lowest (50.6%), 3-6 years the highest satisfaction (21.2%)	*More than 12 years work the lowest (53.5%), 3-6 years work the highest fit (17.5%)*	Less than 3 years the lowest (6.2%), 9-12 years work the highest satisfaction (100%)	3-6 years worked officers the lowest (12%) and the highest fit (58%)
Time worked any schedule	*Less than 5 years the lowest (55.7%), over 15 years the highest satisfaction (21.2%)*	Less than 5 years the lowest (50.4%), more than 15 years work the highest fit (21.2%)	Less than 5 years the lowest (6.2%), 5-10 years work the highest satisfaction (88.2%)	over 15 years the lowest (21.1%), 5-10 years worked officers the highest fit (64.7%)

*Results With bold alphabets significant at 0.05, With Italic alphabets significant at 0.10.

Policy Implications

Developing new work schedules is an essential need for an organization to satisfy its demands and employees' demands. An effective work schedule enables an organization to use resources efficiently. It is also essential for officers to have better and healthier work conditions in order to meet their needs. The current work schedules applied in the TNP, the 12/24 schedule and peace teams' schedule, provide mixed-length shifts (12 and 8 hours respectively) and weekly working hours (56 and 40 hours respectively). A new schedule was found as a must especially for uniform patrol officers who make up 80 percent of the total number of personnel of the Public Order Department. The researcher developed five alternative work schedules based on the data collected in this study. Alternative work schedules are recommended for the TNP patrol units taking account of officers' needs and TNP requirements. The alternative schedules are presented below:

Alternative Work Schedule-1

The first alternative schedule is developed with 4 teams, 8 hours of work and 24 hours of rest. This schedule provides the minimum weekly hours (44 hours) for officers among alternatives, but it still provides an equal number of uniform patrol officers to each hour of the week.

Table 43. Analysis of Alternative Work Schedule-1

Day / Team	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Total Working Hours
Team 1	D	E	N		D	E	N	**48**
Team 2	E	N		D	E	N		**40**
Team 3	N		D	E	N		D	**48**
Team 4		D	E	N		D	E	**40**
D(08-16) - E(16-23) - N(23-08)								**44 Average**

Moreover, the numbers of officers can be a problem when managers attempt to implement this schedule. When compared with the current schedules, the first alternative

schedule provides the fewest numbers of officers in any hour of the week. This schedule can be used successfully in some of the TNP units which have the same workload during each hour of the day. It is clear that this schedule brings more benefits to officers but it may not meet the organizational demands.

Alternative Work Schedule-2

The second alternative was developed with 5 teams working in 8 hour shifts and having a 24 hour rest. With this schedule, the disadvantages of the first alternative schedule are eliminated by using an additional team to cover peak times. This additional team provides variable staff allocation depending on workload. This schedule would have a better fit between workload and the number of officers in order to enhance schedule efficiency.

Table 44. Analysis of Alternative Work Schedule-2

Day / Team	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Total Working Hours
Team 1	D	E	A	N		D	E	**48**
Team 2		D	E	A	N		D	**40**
Team 3	N		D	E	A	N		**40**
Team 4	A	N		D	E	A	N	**48**
Team 5	E	A	N		D	E	A	**48**
D(08-16) E(16-23) N(23-08) A(14-22)								**44.8 Average**

When we compare this alternative work schedule with the current work schedules, again it has the disadvantage of the least numbers of staff during the hours other than those that the additional team works. Although this schedule provides a better correlation between workload and the number of officers in any hour of the week managers might find the low number of officers unsatisfactory, since the total number of officers would be divided by five. The number of weekly working hours (44.8 hours) is also one of the benefits of this schedule for employees.

Alternative Work Schedule-3

The third alternative schedule was developed with 4 teams working in 10 hour shifts. It provides a reduced number of weekly working hours (52) and increases the correlation between workload and the number of officers. One of the characteristics of this schedule is that there is a six-hour overlap between shifts. During this six-hour overlap two teams would work to cover peak crime times.

Table 45. Analysis of Alternative Work Schedule-3

Day / Team	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Total Working Hours
Team 1	D	E	N		D	E	N	**60**
Team 2	E	N		D	E	N		**50**
Team 3	N		D	E	N		D	**50**
Team 4		D	E	N		D	E	**50**
D(08-18) - E(16-02) - N(22-08)								**52 Average**

Again managers can apply this alternative schedule if they need to cover the workload with a sufficient number of staff. This schedule provides not only variable number of officers in different time of day but also convenient duration of shift for officers. Moreover, it enables managers to determine start and end time of shifts depending on the period of peak times.

Alternative Work Schedule-4

The fourth alternative schedule was developed with 4 teams working different schedules. In this schedule, one team works a 12/12 schedule (12 hours work and 12 hours rest) for 5 days, two teams work the 12/36 schedule for 10 days (5 night shifts), and one team works the 12/36 schedule as an additional team during peak crime times. Each team becomes the “additional team” for 5 days. The half of staff of this team can work one night and the night after the other half of the team can work. During weekdays (Friday nights,

Saturdays, and Sundays), the entire team can work to have different number of additional manpower in different days of week. That schedule expected to be provided a better match between the number of crimes and the number of officers.

Table 46. Analysis of Alternative Work Schedule-4

Day / Team	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Total Working Hours
Team 1	D	D	D	D	D	A1	A2	**72**
Team 2		N		N		D	D	**48**
Team 3	N		N		N		N	**48**
Team 4	A1	A2	A1	A2	A1	N		**36-48**
D(08-20) N(20-08) A(14-24 / 16-02)								**51-54 Average**

This schedule also enables managers to assign one-fourth of the total number of officers during the trough crime times and a higher number of officers at the peak crime times. This schedule might be useful during critical days or weeks, if managers use the additional team as a whole. This would increase extensively the number of officers working at certain times of the day and can be used in extreme situations as an alternative to the 12/12 schedule. In addition, the number of weekly working hours (51-54 hours) is another advantage of this schedule for police officers.

Alternative Work Schedule-5

The last alternative schedule is another version of the Alternative four and aims to eliminate its disadvantages. This alternative schedule allows managers to use discretions in deciding the number of additional teams and the working period of the additional team. First, managers should figure out the workload and minimum number of required officers in any time of the day by using statistical data and their experience. After determining the number of additional teams needed, this team can be created by taking into account officers' preference for working in this team and/or officers' accommodation. The rest of the uniform patrol officers can be divided into three groups which are shift groups. Half of

staff of the additional team works nights for five day (Sunday, Monday, Tuesday, Wednesday, and Thursday) and the entire team works on Friday and Saturday nights to meet the increasing workload in these nights.

Table 47. Analysis of Alternative Work Schedule-5

Day / Team	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Total Working Hours
Team 1	D	D	D	N		N		**60**
Team 2	N		N		N		D	**48**
Team 3		N		D	D	D	N	**60**
Team 4	A1	A2	A1	A2	A	A	A1	**60-48**
D(08-20) N(20-08) A(14-24 / 16-02)								**56-54 Average**

This schedule is expected to enhance scheduling efficiency and to satisfy managers' requirements in terms of the number of officers working at any time of the day. In this work schedule, one group works five day shifts with the 12/12 schedule, and five night shifts with the 12/36 schedule. Also the additional team works five days with the 12/36 schedule and two days with the 12/12 schedule, for example, between 14:00-02:00 hours. This schedule can be considered a solution for the current problems in the TNP based on working hours. The fifth alternative schedule not only enables managers to match organizational demands, but also is expected to meet personnel demands much better than the current schedules.

Overall, five alternative schedules were developed and recommended. Although each schedule has advantages and disadvantages, obviously the last alternative schedule is a more efficient and ideal schedule than the current schedules and other alternatives. The second and third alternative schedules also can be used by the Department, but the number of required officers should be increased by adding more staff to uniform patrol. It is believed that the better the work schedule we create, the more officers will apply to work in patrol units in the future, and the more schedule satisfaction and job satisfaction will

emerge. The implications and testing of these alternatives or other schedules with experimental studies are believed to be essential for a better understanding of the effectiveness of schedules on police services and officers.

Conclusion

Shift work plays an essential function in today's society and workforce. Shift work enables organizations to extend production and service hours, and helps them to utilize their resources, especially human resources, more efficiently and effectively. On the other hand, shift work and its arrangements negatively affect employees' health, family and social life, and performance. It is commonly accepted that shift work and night shifts "are associated with increased risk of mood disorders, cardiovascular disease and altered eating patterns, and digestive ailments" (Costa et.al., 2004).

In today's 24-hour society, shift work and working time arrangements are critical issues for police agencies. Numerous studies are conducted on police work scheduling to find optimum schedules for their particular needs. These studies generally focus on measuring the effects of schedule dimensions including length of shift (8, 10, 12 hours, etc.), period of shift (morning, evening, or night), directions of rotation (clockwise or counter clockwise), speeds of rotation (permanent, fast, and slow), start and end time of shifts, and total working hours in a week/month (Totterdell, 2005). Conversely, there are limited studies (Birsen and Badem, 1997; Zengin, 1997; Department of Research and Development, 2001; Ballan, 2001; Baycan, 2004; Demir, 2008) on work schedules in the TNP. From the literature, studies (Birsen and Badem, 1997; Baycan, 2004; Demir, 2008) reported officers' dissatisfaction with work schedules, but no study was found on schedule fit and organizational demands in terms of work schedule. In previous studies, organizational demands were not investigated in order to determine what factors affect organizational demand satisfaction in the TNP. In addition, the peace team work schedule has not been analyzed yet based on organizational and personnel demands satisfaction.

Therefore, in this mixed method study, the satisfaction of organizational and personnel demands were examined in the TNP based on the Discrepancy Theory. The Discrepancy Theory (Morrow et al., 1994, 203; Lawler, 1994, 96) hypothesizes "a match or congruence between worker preferences and organizational scheduling practices will enhance positive employee attitudes and productive behaviors" (Holtom et al., 2002, 903). In the present study, it was proposed that if the work schedules meet the organizational and personnel demands, organizational goals (legality, efficiency, flexibility, and manageability) and personal schedule expectations would be satisfied.

On the theoretical level, this study meets the following assumption of the Discrepancy Theory: "a match or congruence between worker preferences and organizational scheduling practices will enhance positive employee attitudes and productive behaviors" (Holtom et al., 2002, 903). The methods, findings, and recommendations of this study will be of great contributions to work scheduling and literature on working hours of police. This study explored substantial options and standards that would assist police agencies in determining what types of schedules are appropriate for their unit and for their community. In addition, in determining or examining schedules, it is recommended that managers and researches consider factors including characteristics of the area (population, size of area, community, etc.), characteristics of the police unit (number of officers, crime rates, etc.), changeable workload based on hour of the day, day of the week, season, and preferences of officers.

Further research is needed to implement and test alternative schedules. The pre-test and post-test method can be conducted to better understand the applicability of alternative work schedules. Considering the limitations of this study, it is recommended that new studies consider more accurate workload (job demand) factors than crime rates that were

collected with two hours interval by the Izmir Police Department. This factor with a scaling weight of crimes and their effects on workload are believed to provide researchers more precise results. Because of limited data and limited permission, the most commonly applied factor, calls for service, could not be used in the present study.

On the practical implications, the results of the present study are expected to assist TNP management and its community policing initiatives. Better work schedules can be created by understanding and analyzing organizational and personnel demands. For the TNP, first, the needs should be determined for each unit working in shifts to set general standards on work schedules. Then developed schedules based on these standards can be implemented and evaluated. In this study, recommendations and alternative work schedules based on data collected from secondary data resources, surveys and interviews are given to increase the quality of police services, satisfaction and performance of officers, efficiency of equipment usage, and reduction of overtime and sick leave.

Changing the schedule, particularly the 12/24 schedule, has advantages for both management and officers of the TNP. If such a schedule is developed by taking into account both organizational and personnel demands with the participation of all sides: (1) The TNP management would have a more appropriate schedule to meet national regulations and international standards; police stations, one of the most essential and difficult units, would be a favorable place for officers to work; the more motivated officers apply to work at the stations, the more qualified officers and better police services will be emerge; increasingly developed Community Policing initiatives would be supported by satisfied officers who are the first respondents to citizens' service requests; personnel allocation would be better in order to meet the changing workload based on hour of the day, day of the week and season; and health expenses would be minimized by having

appropriate work schedules. (2) The personnel of the TNP would have a better schedule to meet their needs; they would be more satisfied with optimum schedules; they would have enough time for their individual, family and social life.

APPENDIXES

Appendix-A. 12/24, 12/36, and 12/12 Schedules.

12\24 System

Days Groups	1 Mon.	2 Tue.	3 Wed.	4 Thu.	5 Fri.	6 Sat.	7 Sun.
A	**M**	**N**		**M**	**N**		**M**
B	**N**		**M**	**N**		**M**	**N**
C		**M**	**N**		**M**	**N**	
Weekly Working Hours: 56			**M: 08am-08pm**		**N: 08pm-08am**		

12\36 System

Days Groups	1 Mon.	2 Tue.	3 Wed.	4 Thu.	5 Fri.	6 Sat.	7 Sun.
A	**M**		**N**		**M**		**N**
B	**N**		**M**		**N**		**M**
C		**M**		**N**		**M**	
D		**N**		**M**		**N**	
Weekly Working Hours: 42			**M: 08am-08pm**		**N: 08pm-08am**		

12\12 System

Days Groups	1 Mon.	2 Tue.	3 Wed.	4 Thu.	5 Fri.	6 Sat.	7 Sun.
A	**M\N**	**M**	**M**	**M**	**M**	**M**	**M**
B	**M\N**	**M**	**M**	**M**	**M**	**M**	**M**
	N\M	**N**	**N**	**N**	**N**	**N**	**N**
C	**N\M**	**N**	**N**	**N**	**N**	**N**	**N**
Weekly Working Hours: 72*			**M: 08am-08pm**		**N: 08pm-08am**		
*Each officer has 1 day off in a week							

Appendix–B. Peace Teams' Schedule

(An example of a weekly Schedule for a region)

Days / Groups	1 Mon.	2 Tue.	3 Wed.	4 Thu.	5 Fri.	6 Sat.	7 Sun.
A	E	E	E	E	E	E	
B	E		E	E	E	E	E
C	L	L	L	L	L	L	
D	L		L	L	L	L	L
F	M	M	M	M	M	M	
G	M		M	M	M	M	M
H	A	A	A	A	A	A	
I	A		A	A	A	A	A
J	Mot	Mot	Mot	Mot	Mot	Mot	Mot

Weekly Working Hours : 48

Early (E) : 07am-01pm

Morning (M) : 09am-05pm

Afternoon (A) : 11am-07pm (Friday & Saturdays 01pm-10pm)

Late (L) : 01am-10pm (Friday & Saturdays 06pm-02am)

Motorize Patrol : 23/24-06/07

Appendix-C. Survey Questionnaire

Examining the Work Schedules: Satisfaction of Organizational and Personnel Demands

Before agreeing to participate in this research study, it is important to read the following explanation of this study. You are being invited to participate in a survey about employees' work schedule satisfaction. This research project is being conducted by Cihangir Baycan, doctorate student at University of Baltimore. The objective of this research project is to examine the satisfaction of organizational and personnel demands with the current work schedules.

There are no known risks if you decide to participate in this research study, nor are there any costs for participating in the study. The information you provide will help researcher to understand how best to satisfy the needs of organizations and the needs of employees.

This survey is anonymous. If you choose to participate, do not write your name on the questionnaire. Any information that is obtained in this study will remain confidential and will be kept in a secure place. Nothing you say on the questionnaire will in any way influence your present or future employment with your organization.

Your participation in this survey which will take 15 minutes of your time is totally voluntary and you are free to discontinue participation at any time. If you decide to participate, please, do not skip any questions and send your completed questionnaire by using provided envelope that has stamp and receiving address on it.

If you have any questions or concerns about completing the questionnaire or about being in this study, you may contact me at (505) 351-1332 or at baycanc@yahoo.com. If you have any concerns about your rights in this study, you can contact the University of Baltimore Institutional Review Board which has reviewed my request to conduct this project through Margarita M. Cardona, Coordinator & Secretary of the University of Baltimore -IRB at email mcardona@ubalt.edu.

DEMOGRAPHIC QUESTIONS

1. What is your gender?

(a) Female (b) Male

2. What is your age?

_____

3. What is your rank?

(a) Line officer
(b) Lower management (sergeant, lieutenant)
(c) Middle management (captain, superintendent)

4. What is your marital status?

(a) Single (b) Married (c) Divorced (d) Widowed (e) Separated

5. How many dependants live with you (e.g. spouse, parents, and children)?

_____

6. How long have you been working in the Turkish police department?

_____ year(s)

7. In which patrol unit do you work?

(a) Uniform Patrols (b) Peace teams

8. How long have you been working in this unit?

_____ year(s)

9. Which one do you most frequently use to go from your home to work?

(a) By foot (b) Private car (c) Public transportation
(d) Service bus (e) other_____

10. How long does it take you to go from your home to job?

_____ hour(s) _____minute(s)

11. How long have you been working in your present shift system?

_____ year(s)

12. How long have you been working in shifts altogether?

_____ year(s)

Schedule Satisfaction

For each of the following questions, circle the number near the statement which best represents your opinion.

		(1) Strongly Disagree	(2) Disagree	(3) Neither Agree nor Disagree	(4) Agree	(5) Strongly Agree
13.	I am very productive under the current work schedule.					
14.	My current work schedule has a positive effect on my overall attitude toward my job.					
15.	My current work schedule encourages me to do my best.					
16.	Taking everything into consideration, I am satisfied with my life in general while working my current work week.					
17.	I am dissatisfied with my current work schedule.*					
18.	The current work schedule affects my physical health negatively.*					
19.	I would like to change my work schedule.*					

Schedule Fit

		(1) Strongly Disagree	(2) Disagree	(3) Neither Agree nor Disagree	(4) Agree	(5) Strongly Agree
20.	The current method of scheduling causes problems in coordinating work with my supervisor.*					
21.	The current method of scheduling causes problems in coordinating work with my co-workers.*					
22.	The current work schedule affects my family life negatively.*					
23.	The current work schedule makes it easy for me to coordinate my schedule with schedules of other family members.					
24.	The current work schedule affects my social life negatively.*					

*For these questions, Likert scale of 1 to 5 will be reversed to 5 to 1 in order to make all scale at the same direction.

Appendix-D. Interview Questions

Examining the Work Schedules: Satisfaction of Organizational and Personnel Demands

Before agreeing to participate in this research study, it is important to read the following explanation of this study. You are being invited to participate in an interview study that is proposed to obtain detail information on work schedules and to learn managers' thoughts on the current schedules. This research project is being conducted by Cihangir Baycan, doctorate student at University of Baltimore. The objective of this research project is to examine the satisfaction of organizational and personnel demands with the current work schedules.

There are no known risks if you decide to participate in this research study, nor are there any costs for participating. However there is a daily level risk of using phone for interview study. You may stop online interview and asking to continue with face to face interview, telephone interview or you may completely leave study at any time of the interview. The information you provide will help researcher to understand how best to satisfy the needs of organizations and the needs of employees with the schedules. The interviews which will last for approximately one hour will be recorded by the researcher and later transcribed for the purpose of data analysis.

This interview is anonymous. Any information that is obtained in this study will remain confidential and will be kept in a secure place. The records will be destroyed at the completion of the study. Nothing you say on the interview will in any way disclosed without your permission and will influence your present or future employment with your organization.

Your participation in this study is voluntary. If you have any questions or concerns about the interview, you may contact me at (505) 351-1332 or at baycanc@yahoo.com. If you have any concerns about your rights in this study, you can contact the University of Baltimore Institutional Review Board which has reviewed my request to conduct this project through Margarita M. Cardona, Coordinator & Secretary of the University of Baltimore -IRB at email mcardona@ubalt.edu.

Interview Questions

1. Do you work in the City/District level or in the unit/team level of the TNP administration?
2. How do the current work schedules meet organizational demands in terms of legal requirements, manageability, efficiency, and flexibility based on crime rates?
3. How do the schedules satisfy officers' demands in terms of their health, performance, social and family relationships?
4. How do the schedules affect on officers' preference to work on this unit?
5. How do the schedules meet demand changes during every hour of the day?
6. What are the advantages and disadvantages of the schedules?
7. Do you think that the schedules cause problem(s)?

If yes,

8. How do the schedules or the characteristics of the schedules cause the problem(s)?
9. What do you suggest as an optimum solution(s)?

If no,

8. What do you recommend to make schedules even better?

Managers Schedule Evaluation Form										
CRITERIA	Please rate the importance of the below criteria from 1(not important) to 5(very important)					Please rate the satisfaction level of the current shift pattern with the below criteria from 1 to 5.				
	not important				very important	not satisfy				very satisfy
Improves performance against indicators	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
Minimizes overtime	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
Minimizes sickness / absenteeism	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
Good quality of life for officers	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
Popular with officers	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
Meets all Laws and police regulations	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
Provides a match with demand	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
I am satisfied with the schedule						**1**	**2**	**3**	**4**	**5**

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