TELE-WORKING IN SATELLITE TOWNS OF DEVELOPING COUNTRIES

Objectives, challenges and solutions

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Abstract
Traffic congestion and related problems between main cities and new settlements in suburbs and urban fringes is one of the problems that urban and regional planners are always involved with it. This Problem waste the time of citizens, increasing fuel consumption and will cause many environmental impacts. All the mentioned make cities and regions away from concepts of sustainable development. However in developing countries this problem is more visible and crucial but currently in developed countries has cause many problems as well. Because most office jobs are concentrated in major cities, one of the ways to mitigate this problem is reducing demand of daily trips to and from the main cities related to these jobs. In the present article “Tele-working” has been studied as one of the solutions for addressing this problem in Iran as a developing country. The problem that currently, many major cities and related satellite towns in Iran are involved with it. Tele-Working in this approach, refers to performing part of the job in the specified days of the week at home. In this method, in certain days a week, employees work at home instead of physical presence in the company office.
This solution in regard to technological development in fields of communication and telecommunication like cell phone, Internet, fax etc., can create a new work environment and decrease intra-cities trips, road congestion and air pollution. So, the objectives of Tele-working in organizations and companies have been studied and the required solutions for eliminating the barriers will be offered.
Keywords

Tele-working, road congestion, satellite towns, communication tools

1. Introduction

The growth of the urban population in developing countries is inevitable regarding to development concepts (Wheeler, 2004). Iran, as a developing country, isn’t excepted and by studying the statistic related to growth in urban population in years 1956-2006, the necessity of noting new approaches in urban society decreasing the problems of citizens become more clear.

Transportation in cities and road congestion is one of the most obvious problems of citizens of new era. Because of facility, low cost and accessibility of private cars, car ownership has increased 30 times compared with year of 1973 that has caused many social, economic, cultural and environmental problems in metropolitans. Some experts believe that this issue has become one of the enemies of mental and physical health (Litman, 2000) that not only kills time but also causes more air pollution in cities. In new era in which new information and communication technologies has provided low cost and practical solution for many problems, we can expect them to assist urban communities and mitigate the current problems.

Tele-working, as one of the proper solutions in industrial societies for mitigating intra-cities commuting especially for satellite cities has been considered by urban and regional planners for years. In this method, by aid of communication technologies such as cell phone, Internet, e-mail, fax etc. a part of commuting demand to working places is eliminated from satellite towns to metropolitans and a part of works is done in homes of employees and so causes trips to be decreased between metropolitan and its satellite towns. Though this method isn’t applicable for jobs in which physical presence is necessary, but can be very useful for jobs in which computer, reports, articles and calculation are dominant.

It is clear that providing cultural beds and infrastructural development are required for realizing this aim. In this regard, employer must be convinced that this method can decrease the costs of company and employees must come to this conclusion that this method can decrease the cost of commuting and brings more freedom and leisure times. Statistically, the resulted numbers and records are also significant. In one of the studies in Iranian public companies, employees believe that they can work by Tele-working in 27% of working days and managers reports 31% (Mamdohi, 2004).

In other words, if we can provide 7 working days by Tele-working per month for majority of the employees, working trips will be decreased by 30%. Since 15 millions intercity trips are done inside Tehran (Capital of Iran) and regard to this fact that about 1/3 of these trips are done from 6 satellite cities of Tehran, we can expect that 1.5 million intra cities trips will be
eliminated in a day and this can decrease many road congestion and air pollution problems in Tehran.

According to previous studies, analysis of working at home has addressed mainly two sets of issues. Part of it analyzes Tele-working/Tele-commuting. A second concern has been the operation of home-based small businesses, consulting practices, and the self-employed (Pnina O. Plaut, 2005). Research on telecommunications focuses on the role of telecommunications as a possible substitute for travel and as possible remedy traffic problems (Salomon, 1986; Mokhtarian, 1991). Most studies analyze travel behavior of telecommuters based on pilot projects and small self-selected samples. Some have analyzed the employee’s telecommuting adoption behavior from an economic perspective. Others identify the opportunities and constraints of employees and employers to secure effective telecommuting (Brewer and Hensher, 2000; Yen, 2000). There have been several studies of the characteristics of home-based workers and of the travel behavior of home-based workers, Tele-commuters and ordinary commuters (Mokhtarian and Henderson, 1998) but the objective of this article is to study the current problems and barriers of implementing Tele-working in companies in administration that for example, consulting engineers companies and construction companies in Tehran have been studied. In this research, managers and employees opinions have been asked by questionnaires. Information about tools and equipment has been gathered and then analyzed to offer proper solutions for current problems.

2. Tele-working, definitions and concepts

Tele-working was proposed by an American scientist, Jack Nilles in 1970s. Nilles believed that in future people don’t need to go to work and work will come before them. He called this form of working Tele-working as: “ability to do a part of work at home or in a place other than working place by using communication tools” (Nilles, 1988).

Based on the above definition, it becomes clear that many jobs can’t be done by Tele-working and some jobs can be done by this method. That jobs in which computers are used such as typing, calculations, drawings, reporting, etc. are among the jobs that can be done by Tele-working of course, it must be noted that Tele-working means doing a part of work in a place other than working place not all of the work. This means that the employee must attend in his/her working place in certain days of a week because of reasons that will be mentioned, such as evaluating the done works, taking new works, communicating with other employees, avoiding depressions and etc.
In general, Tele-working can be more considered in the following fields:

- Banking and accounting
- Engineering researches and services
- Designing and programming
- Processing texts and graphic data
- Data bases

Evaluating the done works in Tele-working is different from doing works in working place. In Tele-working, amount and quality of the done works are evaluated in lieu of presence time in working place (Ziari, 2009). This causes the employer to become confident about the working hours of the employee and provides more freedom for employee to choose his working hours.

3. Objectives, Advantages and Disadvantage of Tele-working

It is clear that any change in current approaches and habits of a society includes advantages and disadvantages. Tele-working also includes advantages and disadvantages than can be related to employee, employer, labor market or environment.

In general, the advantages of using Tele-working are summarized as following:

- Decrease in intercity and intra-cities trips to working places and homes.
- Decrease in road congestion in the busiest hours.
- Decrease in fossil fuels consumption.
- Decrease in air pollution especially in city centers.
- Decrease in wasting time due to road congestion.
- Decrease in commuting costs.
- Freedom of employees in choosing their working hours.
- Increase in individual presence in his family and increase in mental peace.
- Employing more disabled persons.
- Decrease in companies’ costs related to shirking or malingering.

Among the disadvantages, we can mention the following items:

- Decrease in face-to-face relation between employees in working place and social isolation.
- Need in efficient management systems for referring jobs and evaluating the done works continuously.
- Problems related to maintaining data bases of companies and organizations.
- Lack of experience of employees in using relatively new technologies.

4. Methodology of the research
For studying the problems and barriers against implementing Tele-working in Iran, “Engineering researches and services” sector, which mentioned as one of the sectors for implementing Tele-working in definition part, was selected.
So, two questionnaires, one for managers and another for employees have been prepared and 35 managers and 120 employees from 24 companies, that have been selected from 792 companies registered in list of member companies of Iranian engineering system organization, answered to the questionnaires. The questionnaires for manager contain of the tendency of manager towards hiring employee for Tele-working, interest of manager for hiring disabled persons by this method, tendency for offering facilities to the employee for Tele-working and use of high-speed internet in company as an indicator for use of up-to date technology.
For gathering employees' opinion, a different questionnaire prepared. In this questionnaire, respondents asked for expressing their idea about Tele-working. They also asked for their level of computer knowledge, accessing to internet, wasting time due to commuting and the average cost for their daily trips to and from work. A summary of objects and methods of Tele-working presented to the participants to become aware of the study. For analyzing the outputs of the questionnaires, we used PASW (the new version of SPSS) software.

5. Results
By using the gathered information and studies, the following results have been obtained:

As is clear from the presented diagrams, more than half of the managers (57%) haven’t any tendency towards hiring employee for Tele-working (Chart 1). It seems that among other factors, one of the most important causes of lack of interest in Tele-working is un-interest of managers and employers to Tele-working.
This statistics shows that most of managers aren’t assured about the effectiveness of Tele-working and they prefer traditional systems, because Tele-working needs continuous and systematic management. However, high percentages of mangers (98%) are interested in hiring disabled persons as Tele-working employees (Chart 1).
Employees’ opinions were opposite to opinions of managers. More than 83% of employers were interested in Tele-working (Chart 2). Half of employees had PC at home and 77% of them were inclined to buy computer in installments (Chart 3.)

Output of employees’ questionnaire also shows that more than 72% of employees had mild or low computer knowledge (Chart 4). It seems that another reason for lack of interest in Tele-working is low familiarity with computer and related software among employees. We can see this fact from two aspects. In one hand, the employees faces with Tele-working with preservation, because of low familiarity with computer, software, Internet and other technologies and fear from confronting with these technologies. On the other hand, the employer looks doubtedly to Tele-working because of the above-said reasons.
Another barrier that is less important is lack of tools and equipment needed at home of some employees. As can be seen in Chart 1 and 3, most managers are inclined to offer equipments such as computer installment to the employees and employees are also inclined to buy computer in installments.

<table>
<thead>
<tr>
<th>Employees having computer at home</th>
<th>Employees having access to high speed Internet at home</th>
<th>Employees were desired to buy computer in installments</th>
</tr>
</thead>
<tbody>
<tr>
<td>54%</td>
<td>38%</td>
<td>77%</td>
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Amount of wasted time and money are also significant and shows the importance of having new attitudes in this issue. Chart 5 shows that 22% of employees pass over 2 hour in road congestion. Chart 6 shows average cost of employees’ trips that is relatively high for 21% of employees.
6. Conclusion and recommendation

States of society and our metropolitans require us to decrease road congestion, to build new roads, to equip city transportation fleet and to decrease intercity and intra-cities trips. Since one of the most important reasons for citizens’ transportation in cities is to go to work and return home, decreasing this commuting can significantly decrease road congestion and costs and air pollution. In the present article, we tried to study Tele-working as one of the solutions for decreasing road congestion in metropolitans and between metropolitans and satellite cities, and also the main problems of not notifying this issue.
Based on questionnaires and information analyzing, implementing Tele-working in companies and organizations faces with two main barriers: First, low familiarity with this issue and second, weakness of employees for using new technologies.

In regarding to the results, it seems that two solutions can promote Tele-working among companies and organizations in Iran:

1- Teaching managers about Tele-working and its effect on decrease in company costs and its positive effects on road congestion and air pollution and also manner of managing work allocation and evaluating Tele-work employees.

2- Training employees about learning new technologies and better use of computer and the software related to their jobs for enjoying the advantages of Tele-working.

It is expected that in regard to the obtained results in the present research, if companies and organizations try to train middle managers and employees for becoming more familiar with the software related to their jobs, we can try to implement a new administrative system for employees and their jobs and reduce part of daily trips for having more sustainable cities and regions in our country.

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