

The Effect of Teleworking on Side Effects of Traffic Congestion and Urban Traffic Load: Case Study: Kermanshah Province

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Abstract: Nowadays with regard to the high volume production of domestic cars and importing the foreign cars without considering its side effects and effects that have in our social life, they have made us see their difficulties and plights day-to-day; some side effects of congestion and urban transportation traffic are: overconsumption of energy and fossil fuels- formation of greenhouses-environmental pollution-Prevalence of skin and respiratory diseases-destruction of ozone layer-further heating of earth planet-formation of weather inversion phenomenon-mental pressures. However, with regard to this issue that we are living in twenty first century and optimized using of Information Technology (IT) is necessary in all levels of society, one of the newest ways and methods about reduction of side effects of congestion and traffic of urban transportation is the optimized and desired using of ((teleworking)) category. However using of teleworking method needs institutionalization of use of this method in all society groups. In this research which has been accomplished in the field form, we have considered 6 general ministrations and governmental organizations and 2 private companies in which semi-heavy riding cars and road vehicles have the most usage. And following it, they have caused harmful effects for the society groups. Therefore in this regard, we have started to prepare poll forms that include 10 questions and we distributed 247 poll forms. And due to the reliability and validity of the questions of poll forms, Delphi method was used. And in order to analyze the responses of the questions, SPSS software has been used; at the end with regard to the conclusion which was obtained from the responses of poll forms, we presented constructive suggestions.

Key words: Urban traffic, traffic load, teleworking, environmental pollution, energy consumptions

INTRODUCTION

Traffic and transportation problem in large cities and especially in Kermanshah metropolis is a problem which has affected on the life manner of all society groups such as manager, employee, tradesman, scholar, student. This problem in addition to waste the time of the society people, on one hand has caused to appear the environmental problems and on the other hand it causes to impose a heavy economic load on the body of society and government.

Difficulties and problems arising from transportation and traffic: The transportation and traffic issue that nowadays as a political-social phenomenon plays a very sensitive and important role in the economic-social structure and quality of a society, forms the basis of urban new life and displacement needs of human.

Therefore most of the main and arterial roadways of the city in the culmination hours have the traffic load more than capacity and public transportation system can not

respond to the displacement of passengers lonely. Congestion of the main and catchy uses of travel, tourism and hospitality, high price of land and the limited possibility of creating the wide passage-ways and corridors, have converted the central areas of Kermanshah city to the overcrowded and problematic areas.

In such conditions, development of public transportation system, completion of highway network and intelligent management of vehicles and more important than all using of new method of ((teleworking)) are suggested.

Optimization of public transportation in reduction of problems related to transportation and traffic: Public transportation is one of the necessary needs of urban societies. Reduction of efficiency of public transportation system causes to develop the ownership and tendency of using of personal vehicles and their concentration in the level of urban passage-ways network. This case affects on all trips especially public transportation performance

and creates the conditions for the urban planners and managers that macro-investment for construction of new passage-ways or changing the existing networks will be needed.

The recent crises of air pollution in the country indicate the necessity of comprehensive attention to the problem. The issue of fighting with environmental effects of transportation all around the world has been considered by politicians especially and wide researches have been accomplished in order to give direction on how to reduce it and achieving the clean transportation system. In this study, at first a review on global experiences in the domain of environment and urban transportation has been accomplished and after studying the effective policies in this field, some important solutions at high level have been presented.

Congestion of urban transportation and destructive effects of environment: According to the evidences of global statistics of united nations, one of the most destructive things which cause to destruct the environment and its pollution is overuse of personal cars and lack of efficiency of public vehicles while annually millions dollars have been spent to compensate these losses in long-term. Importing the environmental issues in the urban transportation strategies for reduction of pollution arising from it, identification of pollutant vehicles, controlling on tax management of cars fuels and exerting the technical controls on the technology of cars construction are needed. Mostly, using of motorized transportation is difficult for the persons with low income while because most of them live and do activity in the shadow of motorized transportation, harmful environmental effects hurt them most of all. Environmental protection should be considered as the necessary part in the improvement of the life quality of low-income persons.

It has been estimated that annually and especially in less developed countries, due to the lack of enough management and powerful planning in traffic and transportation issues, millions persons die or are affected by the kinds of related diseases such as skin cancer,... This number compared with the persons who die due to the urban driving accidents is more. Also exposure to lead causes to appear behavioral problems and disability in learning of urban children and it reduces the life quality. Transportation is the main factor in reduction of air quality of the cities and up to 75% of air pollution is caused by the passage-ways traffic. Personal cars allocate the most shares in pollution to themselves. The factors of traffic which are effective to intensify the air quality reduction are: the wear and tear of personal and public vehicles fleet and congestion of traffic which increases the fuel consumption up to 25%.

From macro-perspective, the environmental effects of urban transportation are divided into 3 general groups: Energy consumption and global warming, noise and air pollution, land use and the effects arising from it.

MATERIALS AND METHODS

High consumption of energy due to the severe traffic and global warming: We should consider that there are some kinds of energy which are non-renewable and with regard to this fact that we live in an era that one of the problems is lack of having energy in its kinds and certainly we should say that in near future, having the energy kinds is considered as power for each country and government.

Fossil fuels consumed in motorized transportation are non-renewable resources which have significant consumption in the factories which construct the motorized vehicles and infrastructures. Despite of improvement in fuel consumption of motorized vehicles and increasing of its efficiency, the amount of energy consumption due to the increasing of the trips distance practically has been increased. In 1973, Organization of the Petroleum Exporting Countries (OPEC) adopted the policy of limiting the production that following it the price of petroleum was increased severely. This action had wide economic and political effects. In this period, transport system policies in developed countries were affected by significant changes and they were conducted toward reduction of using of personal car and more using of public transportation.

Possible strategies for saving in energy consumption can be classified into five groups:

- Using of public transportation with more efficiency and less fuel consumption
- Usage of new technologies
- Organizing the traffic flow
- Reduction in total vehicles- traversed kilometer

And fifth case that unfortunately is neglected in executive plans or exerted in pale or sectional form is the same way and new method of ((teleworking)).

The side effects of changing the use and congestion of urban traffic:

- Excessive using of the suburb lands
- Change in the regional weather system
- Creating the pollutant lands under use as the burial place of worn-out cars.
- Reduction of green space and lands with agricultural use in favor of other uses
- The effects arising from environmental imbalance

- The rise of urban areas toward natural habitats
- The problems arising from air pollution in cities and reduction of visibility
- Incompatible uses created in the city

The creation of unsafe areas physically and in terms of expected and unexpected accidents: Now with regard to the mentioned cases, some of the policies and solutions will cause to reduce the difficulties and problems of congestion and traffic of urban and suburban transportation, the intended cases are as follows:

The solution of targeting the technical inspection and diagnosis of cars: Without technical diagnosis and inspection of cars, using of pollution reduction technologies will have no profit. Defective cars usually produce pollution severely and cause the imbalance in the total amount of pollution produced by vehicles.

According to the information collected in India, the diagnoses once a month for two-wheel vehicles indicated that only slight repairs of vehicles have caused to save 17 percent of economics and reduction of 44% of CO amount. It is clear that if the level of doing the repairs is raised, achieving the pollution status standards will become simpler. Moreover, we should consider this issue that using of euro fuel 4 and 5 and utilizing of global standard vehicles from production stage to the marking stage must be accomplished seriously and accurately and we should start the cure from prevention not disease stage.

Recovery of worn-out and scrap cars and its effects on reduction of urban traffic: In many developing countries, especially in the countries in which the pollution is resulted from very important suspended particles, commercial vehicles like buses, trucks and taxis are considered as pollution production resources in urban areas. With strict implementation of standards related to reduce the air pollution, the price of old and worn-out cars has been reduced and people are attracted toward buying the new cars, about scrap cars, serious control should be considered that even reusing of its pieces is prevented in other cars.

Targeting the fuel status and its effect on reduction of traffic and transportation congestion: The researches results and different evaluations accomplished in six large cities of the world have indicated that determining a tax about 60% of expense related to import the gasoline and 200% of expense for importing the diesel fuels can be suitable tax for exerting on the fuel price. In the world, the finished price of diesel fuels is usually less than gasoline.

Due to the reduction of changeable and productive expenses, much difference of kerosene and gasoline prices has caused that kerosene to be added to the gasoline illegally and the resulted mixture is consumed as fuel and it causes to produce high volume of suspended particles. With continuation of such proceeding, the vehicles which are used a lot like taxis, minibuses, ... will use of diesel instead of consuming clean fuels like cng. A fuel which is very harmful for urban areas.

A usual reason for determining less tax on diesel is to use of it in suburban cargo vehicles and agricultural instruments. With regard to this issue that the suspended particles effect in sparsely populated areas and suburbs is less than the high traffic areas, preferring the economic aspect of using of diesel to its pollution production aspect doesn't seem very illogical. A possible way for creating an acceptable balance between two seemingly contradictory items listed is to identify the most pollutant urban vehicles like trucks and diesel minibuses and determine the heavy tax on them and more control on fuel distribution positions and fuel transport to all points of the country can be mentioned as other cases.

Using of new management method in transportation system: The management policies of transportation system for reduction of urban traffic effects on the air pollution status can be divided into four parts:

- Policies of priority allocation to the methods which produce less pollution (gaslights, rail system, ...)
- Policies of pollution reduction by applying the pollution control methods (traffic management) (applying the chemical transformers- elimination of lead from gasoline, etc)
- Policies of pollution reduction by applying the methods for the vehicles volume control.
- Using of new management methods of control and reduction of traffic volume of employees physically (teleworking method)

Targeting the public transportation: In developing countries, the buses are usually the selected vehicles of very low-income group and due to many stops at the stations and because at that time, their engine is still working and because of their vain functioning in high traffics, the buses produce pollution severely. Regard to the bus system not only will be very effective on reduction of air pollution but also it will cause to prefer the bus to private cars. By attracting more passengers to the bus system, the income of this section will be also increased. Considering the special route for buses and also designing a regular and pervasive network for

transferring the passengers can cause to reduce the purchase demand and use of car. With regard to this issue that the policy of the country authorities should be in order to optimized use of renewable fuels consumption, about production of cars which are produced with these fuels and are put in public transportation fleet system, special regard should be exerted in this field.

In order to know this fact that if we don't implement the policies of transportation traffic reduction, we will be affected by some incurable diseases, we mention some of them in detail.

Destructive side effects of traffic and transportation on human health: Traffic in recent years is a very prevalent issue and what has anguished the health experts is the increasing of population volume which has been exposed to traffic and its pathogenic effects. The researchers' study in Chalmers University of Sweden indicates that the noises arising from traffic are harmful for health and noise pollution is one of the most important factors which threaten the health and it is related to anguish feeling, sleeping disorder, stress, depression. According to these studies, blood pressure and the probability of heart attack and also affecting by diabetes can be mentioned as the effects of noise pollution.

Statement of the research problem: It should be said that this study has been extracted from a research project for one of the governmental and executive institutions and it is a field and case research of six governmental organizations and two large road construction companies of private section. Apart from mentioned cases about reduction of traffic load and its destructive effects that are staggering financially and sometimes irrecoverable, the new way and method of ((teleworking)) can be mentioned which is the main purpose of our research and it has proved that can reduce the traffic congestion and its side effects. We should acknowledge that teleworking category which recently has been in the hand of tenth government or previous governments, has been implemented in sectional form and we should know its reason in administrative cumbersome laws and personalization act of some authorities, therefore we have accomplished this research and field working in Kermanshah province which is considered one of the provinces in which migration of rural people to the city or migration of satellite cities to the province center now due to many reasons such as the period of Iraq imposed war against Iran and this fact that Kermanshah province is coterminous with Iraq and its cultural and religious variety and this issue that the researcher has been predominant on the field population of the research, has been known as the best sample about our research subject.

Teleworking and its effects on reduction of urban traffic:

Teleworking is a method in which without considering our physical, chronological and geographical status, we can do the duties flawlessly and correctly (teleworking and the ways and methods, Ezadi, Bakhtar newspaper, 2016).

It should be said that teleworking is a selection about the method of doing the work that let the employees do all or part of their work out of the work environment, namely the persons can do their work duties from their home or a telecommunications center near their home or another work place (connections journal, September 2004).

Using of computer and telecommunications in order to change the geographical status of the work place and doing the job duties (Europe commission).

With regard to Mr. George Simmel talk, a German sociologist that says: twenty first century isn't production of goods and services, rather it is the century of information production and exchanging it among the society groups.

Optimized using of new systems and installing them and creating hardware and software contexts can cause to increase the teleworking category among the society sections and employees of different sections of governmental and private organizations.

RESULTS AND DISCUSSION

This scientific research has been accomplished with poll forms which have been distributed and taken in six general governmental ministrations and two large private companies in Kermanshah province, for example, at first we considered a sample of private and governmental section and started to present report of the work proceeding, trip expense, fuel consumption, ... that finally and with regard to the personal experience of the researcher and his predominance on the administrative status of the ministrations in the research, six governmental ministrations and organizations and two private companies were selected which have been placed in the geographical status and different industrial, services and administrative sections that totally 247 poll forms were distributed and taken from the employees of these ministrations (as the statistical population of the research) and 10 main questions were included in those poll forms (that each question includes several subsidiary questions) and finally we can find out people's importance and satisfaction about teleworking from taken poll forms.

We presented significant and general questions which are mentioned below (Table 1):

- Teleworking effect on reduction of crime and corruption

Table 1: Significant and general questions.

Poll form questions	Weight	Grading	Weight score
Teleworking effect on reduction of crime and corruption	0.16	4	0.64
Teleworking effect on increasing the life span of constructive infrastructures	0.14	4	0.56
Teleworking effect on increasing the innovation, creativity and new thoughts in societies	0.13	4	0.52
The role of new technologies in implementation of teleworking	0.12	4	0.48
The role of new managements in using of technology method	0.11	4	0.44
Teleworking effect on increasing the employment	0.1	3	0.3
Teleworking effect on reduction of environmental pollutions	0.08	3	0.24
Teleworking effect on increasing the economic power of family	0.06	2	0.12
Teleworking effect on reduction of urban traffic volume	0.06	1	0.06
Teleworking effect on reduction of energy consumption	0.04	1	0.04
Total	1		3.4

- Teleworking effect on increasing the life span of constructive infrastructures
- Teleworking effect on increasing the innovation, creativity and new thoughts in the societies
- The role of new technologies in implementation of teleworking
- The role of new managements in using of teleworking method
- Teleworking effect on increasing the employment
- Teleworking effect on reduction of environmental pollutions
- Teleworking effect on increasing the economic power of family
- Teleworking effect on reduction of urban traffic volume
- Teleworking effect on reduction of energy consumption

It should be said that among the points which are needed for implementation of teleworking case, Kermanshah province has been selected for the management issues, administrative structures and infrastructures of our statistical population. With regard to the analysis which has been accomplished from poll forms, we mention the following cases:

The advantages of teleworking for organizations and employees in different kinds of governmental and private sections:

- The organizations power is increased in optimized selection of expert and scientific work force
- Excessive crowd of work places and the need to the physical work places are reduced
- The need to the large buildings and long and wide ministrations is reduced
- The employees absence is reduced
- The organizations will have more power for responding to the immediate and necessary needs, because they can submit a part of their work to the remote employees
- Facilitation of doing the affairs which must be accomplished secretly and reducing the possibility of disclosure of intended work project

- Increasing of productivity and following it effectiveness of work and more efficiency of employees
- Teleworking removes the chronological and spatial limitations. Now you can live in the best areas with good weather from the suburbs to countryside of mountain
- Reduction of trips and the expenses arising from it which include the transportation expense and monetary value of the wasted time in the way.
- The time which was wasted in daily trip to the work place, now can be spent for keeping the children and old parents
- Expansion of the right for selecting the job and work. Be the employee of each company or organization that you like, its place or nationality doesn't differ anymore

Economic-social advantages of teleworking for employees and society: Reduction of interurban traffics and the problems arising from it like air and environment pollution; reduction of need to construct the roads and expansion of highways; the job opportunities are prepared for the persons who have disability or special disease and their presence in customary ministrations is illogical and unnecessary.

The work force market is developed, namely the selection power of organizations becomes more for optimized selection of their needed work force because until yesterday, the organizations had to submit the work to one of the experts of the same city (or geographical region) but today through teleworking they can submit the work to any expert that has more abilities and skills which is the same meritocracy. Therefore, it creates equal employment opportunities for all apart from place and their position that indicates social justice.

Reduction of population growth of large cities; the influx of work force to the large cities for achieving better employment opportunities is reduced.

CONCLUSION

This study has been accomplished according to a research project about teleworking effect on side effects

of transportation congestion and urban traffic load and it was a case study of Kermanshah province that our field population includes six general ministrations and governmental organizations such as: general ministration of road and urbanism-municipality-general ministration of social security-inspection-governorship-agricultural jihad and also two companies of private section of Saman cement company and road construction company of the road border.

It should be considered that in order to succeed in each plan, at first its structure and culture should be prepared so that we can succeed in implementing it. With regard to the distribution of poll forms and the presented responses, it became clear that the people in our research have the necessary readiness about teleworking method and therefore only implementing the plan and software and hardware institutionalization and more important than all, persistent respectful authorities are the necessities and importance of implementing the work. We hope that appropriate actions for implementing the teleworking to be accomplished by expertise work.

LIMITATIONS

The limitations of teleworking method in statistical population:

- Unfamiliarity of managers with advantages and usages of teleworking and generally ICT
- Instability and uncertainty of communicative lines
- The relatively high expense of hardware equipment installation
- High expense of communications
- Inefficiency and low knowledge of IT section employees
- Foreign language weakness of the most persons
- Lack of regulations for teleworking
- Lack of expert and educated forces that are familiar with software and hardware systems

RECOMMENDATION

Suggestions about implementation of teleworking in all governmental and private sections:

- Developing the computer networks
- Increasing the bandwidth of computer networks
- Developing the administrative automation
- Identifying the advantages and usages of teleworking to the managers and decision-makers community.
- Familiarizing the employees with computer, network and the manner of their usage for doing the remote affairs better, specifically simplification of work with network and computers (making the connector software user-friendly)

- Financial aids or exerting tax discounts for the companies which work with the purpose of teleworking export
- Movement toward electronic government
- Familiarizing the public people with computer and network facilities and encouraging them to use
- Propagation and publication of information about teleworking opportunities
- Global introduction of relative advantages of Iranian work force
- Preparing the software for facilitating the special works of jobs
- Developing and keeping the expert force of IT
- Movement toward information community
- Movement toward economy based on knowledge

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