

## ORIGINAL RESEARCH PAPER

# E-shopping and in-store shopping status in Tehran: Can e-shopping reduce traffic in the future?

*A. Edrisi\*, H. Ganjipour*

*Department of Civil Engineering, Khajeh Nasir Toosi University of Technology, Tehran, Iran*

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**ABSTRACT:** Nowadays Information and Communication Technology effects on all aspects of human activities, such as teleworking, electronic commerce, electronic banking, electronic learning, etc. the most of these services can prevent unnecessary travels in cities especially in rush hour. The aim of this study is to explore the frequency of electronic shopping and in-store shopping in Tehran, according to gender, educational background and employment status in order to obtain some information about the behavior of online and traditional shoppers in Tehran. For this purpose, 510 questionnaires were collected and the shoppers were categorized and analyzed in some groups, using SPSS23. The findings showed that the people often tend to buy their favorable products traditionally. As expected, the percentage of people that never experience electronic shopping is high but the development of online shops and mobile apps can attract people to this way of modern shopping. A good strategy for improving online marketing will reduce traffic congestion, travel time, energy consumption, and air pollution and so on.

**KEYWORDS:** *Complementarity; E-commerce; E-shopping, Information and communications technology (ICT); Shopping trips, Spss*

## INTRODUCTION

One of the greatest problems associated with traffic in Iran (especially in Tehran), is air pollution. Increasing the number of people who die or suffer from heart and respiratory illnesses, is the most dangerous consequence of air pollution (Rashidi *et al.*, 2012). In Iran mega cities such as Tehran, 8 billion Dollars per year are spent on these diseases (Sarraf *et al.*, 2005). Modeling the air pollutants' dispersion is vital to handle the air quality problems (Joneidi *et al.*, 2018; Holnicki *et al.*, 2017; Demirarslan *et al.*, 2017; Abdul-Wahab *et al.*, 2016). Transportation system consists of vehicles that are responsible for the emission of many air pollutants and also plays a key role in urban air quality (Zhang *et al.*, 2011). There are many studies

that focus on calculating the emission of air pollutants from different vehicle categories (Shahbazi *et al.*, 2016; Fameli and Assimakopoulos, 2015; Wu *et al.*, 2014; Shafie-pour and Tavakoli, 2013).

There are many essential policies for improving the air quality in Tehran. Upgrading transportation system with updated fuel quality is one of them (Ghadiri *et al.*, 2017). On the other hand, for reducing the traffic congestion, energy consumption and air pollution, transportation demand management (TDM) strategies can be implemented. For example, the proper use of Information and Communication Technology (ICT) can significantly contribute to the stable transportation system (Black and Van Geenhuizen, 2006; Li and Yu, 2017; Wang *et al.*, 2015). E-shopping is one of the branches of ICT that may be able to prevent the

\*Corresponding Author Email: [edrisi@kntu.ac.ir](mailto:edrisi@kntu.ac.ir)  
Tel.: +9821 8877 9474; Fax: +9821 8877 9475

generation of unnecessary shopping trips, especially during the peak traffic hours (Mokhtarian, 2004). Actually, E-shopping is an effective method in reduction of shopping trip and can lead to considerable decrease of traffic congestion, energy consumption and air pollution in Tehran (Tehrani *et al.*, 2009, 2010; Tehrani and Karbassi, 2005).

The relationships between e-shopping and traffic are more complex than they appear (Cao, 2009). E-shopping can reduce the traffic congestion by replacing with shopping trip. Also it can affect freight traffic because goods delivery tours cannot always be optimized (Comi and Nuzzolo, 2016). On the other hand it can generate trips by encouraging additional shopping-related travel. For example, e-shopping eliminates travel time for buying goods from stores and time saved may be used for other shopping-related travels (Zhen *et al.*, 2016). In other words, E-shopping process (searching and purchasing goods online) can affect shopping trip in four ways: substitution, complementarity, modification and neutrality (Mokhtarian, 2004).

- Substitution: e-shopping can replace in-store shopping. Individuals purchase their products online, therefore shopping trips gradually decrease.
- Complementarity / Generation: e-shopping can lead to conducting new shopping trips. (For example, a person searches a product online and then makes a trip to the store to examine and test it or purchase accessories)
- Modification: e-shopping can alter some aspect of shopping trip, without affecting the decision to make the trip itself. (For example, making shopping trip at different time of day with different mode of transportation, or deciding to visit a different store) (Lee *et al.*, 2017).
- Neutrality: e-shopping may have no effect on physical travel to store.

Some of the previous studies concluded the substitution relationship between e-shopping and in-store shopping (Sim and koi, 2002; Tonn and Hemrick, 2004; Weltevreden and Rietbergen 2007). Dixon and Marston (2002) reported that two-thirds of online shoppers purchased all or most of their products via internet. Bhat *et al.* (2003) explored that 78% of individuals who purchase their products online, make fewer physical trips to store. In Greater London, for households with internet shoppers, there is a negative relationship between in-store and online grocery

shopping (Suel *et al.*, 2015). In terms of complementarity, most of recent studies showed this relationship (Ding and Lu, 2015; Edrisi and Ganjipour, 2016; Zhou and Wang, 2014; Rotem-Mindali, 2010; Cao *et al.* 2010, 2012). Zhen *et al.* (2016) examined the relationship between the amount of e-shopping and in-store shopping in China based on four types of goods including clothing, daily items, books, and electronic devices. Based on data collected from 963 citizens in Nanjing, China; they reported the complementary relationship for all four types that its value actually depends on the type of goods. Lee *et al.* (2017) studied the effect of personal characteristics, attitudes and perceptions on e-shopping in Davis, California. They concluded that people's attitude and perceptions play a significant role in shopping decision. It seems that e-shopping increases in-store shopping instead of reducing it. Both complementary and substitution effects have been found in the Scottish Isles (Calderwood and Freathy, 2014) but they showed that e-shopping has a limited impact on shopping trip. There have been few studies reported the modification and neutrality relationship. For example, Ferrell (2005) found some modification effect and stated that Americans who teleshop (shop via internet, phone, email, etc.), tend to travel a shorter distance to buy goods. Tacken (1990) showed that 28% of individuals use their cars less frequently, 23% often travel on foot and 14% use bicycle because of teleshopping. Casas *et al.* (2001) indicated that there is no significant relationship between the number of shopping trips made by online shoppers and conventional shoppers.

The aim of this study is to explore the behavior of e-shoppers and non e-shoppers according to socio-economic characteristics, internet experience and frequency of e-shopping, in-store shopping and product information search via internet.

## MATERIALS AND METHODS

In order to explore the behavior of e-shoppers and non e-shoppers in Tehran Municipality, a questionnaire has been designed based on personal characteristic (age, gender, educational level, marital status, household income, and employment status), shopping behavior (non-daily e-shopping and in-store shopping, frequency of product information search via internet), shopping attitudes (based on a five-point Likert scale) and internet experience (years of using internet and frequency of personal internet use). At first, the survey

was conducted in 10 days through randomized personal interviews at the venue of 28<sup>th</sup> Tehran International Book Fair (6 -16 May 2015). Before selecting this event for data collection, authors consulted with a number of experts with experiences in this regard.

In the recent decade, Tehran International Book Fair has seen a significant growth and development in all aspects of publishing industry, library equipment, panel discussions and cultural projects (such as review sessions, lecture sessions, writing workshop, etc.). So this public event currently attracts a wide variety of people with different age groups, social class, income levels, and professions with a balanced gender distribution, and it is not restricted or limited to book readers, authors, publishers or researchers (Azadeh *et al.*, 2012). It is necessary to mention that people from all over the country attend this Book Fair, so before starting the interview respondent were asked whether they were residing in Tehran or not. Due to massive attendance in book fair, which hindered the process of interviews, data collection was continued in parks and other public places from May to June 2015. The total of 531 questionnaires were distributed through face to face interview. Most questionnaires were filled by

people attending the International Book Fair. In order to achieve more suitable and accurate data and also because of incomplete and ambiguous responses, 21 questionnaires were excluded from data analysis, reducing the total number of samples to 510. Data collected from 510 questionnaires were studied in order to explore the status of e-shopping and in-store shopping according to descriptive analysis. The reliability coefficient of questionnaire is 0.70 based on Cronbach alpha.

It should be noted that this process of data collection, like any other similar process undertaken in other studies, naturally faced problems such as disinterest in participation, inadequate attention, and misplaced or incomplete filling of questionnaire on part of respondents.

## RESULTS AND DISCUSSION

After collecting the valid questionnaires, raw data was imported into Spss23 software (IBM Corp. Released 2015. IBM SPSS Statistics for Windows, Version 23.0. Armonk, NY: IBM Corp) for descriptive analysis. Economic and demographic characteristics of 510 individuals participating in this study are presented in Table 1.

Table 1: Demographic characteristics of 510 respondents

	Male	Female	Total	
Frequency of e-shopping	Never	43	82	125(24.5%)
	less than once a year	37	55	92(18%)
	1-3 times per year	78	59	137(26.9%)
	4-6 times per year	28	31	59(11.6%)
	once a month	35	24	59(11.6%)
	more than once a month	25	13	38(7.5%)
	Total	246	264	510
Frequency of in-store shopping	Never	4	2	6(1.2%)
	less than once a month	95	88	183(35.9%)
	1-3 times per month	84	97	181(35.5%)
	once a week	37	51	88(17.3%)
	more than once a week	26	26	52(10.2%)
	Total	246	264	510

The two important variables are the frequency of e-shopping and the frequency of in-store shopping. In the survey, respondents were asked to answer the questions “how often they buy their non-daily products from internet” and “how often they go to store for buying them”. The options are shown in Table 2. According to descriptive analysis, among the 246 male respondents, 17.5% (43 individuals) have never bought anything online, and for 264 female respondents this ratio is 31.1% (82 individuals). Meanwhile, 14.2% (35 individuals) of male participants and 9.1% (24 individuals) of female participants use internet at least once a month to purchase their non-daily needs. In terms of age group, respondents of 31 to 35 years old have the lowest percentage of people who have never done any e-shopping while respondents of 26 to 30 years old have the highest percentage of people who use internet purchase at least once a month. 29% (100 individuals) of 345 single (unmarried) respondents, and 15.2% (25 individuals) of 165 married respondents have no previous

experience of e-shopping but 11% (38 individuals) of single respondents and 12.7% (21 individuals) of married respondents e-shop at least once a month.

As shown in Table 2, only 6 people (1.2%) never bought their non-daily goods from store while it reached 125 people (24.5%) for e-shopping, indicating that e-shopping and internet usage (in order to speed up the daily activities) has not become prevalent and stable yet. In case of expanding the internet usage, high progress can be seen in the field of transportation and traffic. As it can be seen, men are more willing to buy things online. While women tend to generate trips to the store, examine and see goods closely, and then buy.

It should be noted that another important question is “how many years have the respondents used internet”. Only 2% (10 people) of the statistical society have recently used the internet and have been familiar with it less than one year and the rest had used it for at least 1 year [162 people (31.8%), 193 people (37.8%), and the rest have been using the internet more than 10

Table 2: Frequency of e-shopping and in-store shopping according to gender

	Male	Female	Total	
Frequency of e-shopping	Never	43	82	125(24.5%)
	less than once a year	37	55	92(18%)
	1-3 times per year	78	59	137(26.9%)
	4-6 times per year	28	31	59(11.6%)
	once a month	35	24	59(11.6%)
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years, between 5 to 10 years, and between 1 to 5 years, respectively]. Nevertheless, e-shopping has not been widespread in Tehran, yet.

Furthermore, the respondents were asked to express “how often they use internet for their personal purpose (not job purpose)” and also “how often they search for products/stores information via internet”. 342 people (67.1%) of the statistical society use the internet several times a day for personal purposes while only 15 people (2.9%) use it rarely (for example, once in two/three months). It shows that a large number of people are involved with the internet, but a small percentage of them buy their products through it. More interesting is that 375 people (73.5%) search for goods/stores on internet and compare the prices several times a month, a week or even a day. However, as shown in Table 2, only 97 people (19.1%) shop online at least once a month. This means that after searching products over the internet, most of the people not only do not shop online, but also generate a separate trip to the store, examine the goods closely, and buy it if needed.

Table 3 provides statistics of employment status of statistical population. Accordingly, 43.7% of people are unemployed, the rest are working full-time or part-time, and a very few percentage are retired. According to this table, employed people (full-time or part-time) buy more online. Moreover, full-time employees shop online more than part-time ones. This can be due to the fact that full-time employees do not have enough time to make physical travel to store (because of being highly busy, the problems of access to stores due to traffic congestion in Tehran, lack of enough time to address other daily programs, etc.) Therefore, they save their time and money by changing their shopping style (from traditional to online form).

Among the 297 students (or 58.2% of respondents), 23.5% of them (70 students) never bought anything from internet markets while only 7.4% (22 students) buy their non-daily products more than once a month from internet. This amount for 213 non-student respondents is 28.5% and 7.5%, respectively. As shown in Table 4, 28.8% of individual that have Bachelor

Table 3: Frequency of e-shopping and in-store shopping according to employment status

	Full-time	Part-time	Unemployed people	Retired	Total	
Frequency of e-shopping	Never	36	21	68	0	125
	less than once a year	29	23	39	1	92
	1-3 times per year	60	21	53	3	137
	4-6 times per year	21	16	22	0	59
	once a month	27	5	27	0	59
	more than once a month	15	9	14	0	38
	Total	188	95	223	4	510
Frequency of in-store shopping	Never	2	0	4	0	6
	less than once a month	83	31	67	2	183
	1-3 times per month	60	39	82	0	181
	once a week	27	16	44	1	88
	more than once a week	16	9	26	1	52
	Total	188	95	223	4	510

Table 4: Frequency of e-shopping and in-store shopping according to Educational level

	Below a Bachelor	Bachelor	Higher than Bachelor	Total	
Frequency of e-shopping	Never	32	68	25	125
	less than once a year	14	46	32	92
	1-3 times per year	20	60	57	137
	4-6 times per year	9	28	22	59
	once a month	13	18	28	59
	more than once a month	7	16	15	38
	Total	95	236	179	510
Frequency of in-store shopping	Never	2	4	0	6
	less than once a month	31	76	76	183
	1-3 times per month	34	86	61	181
	once a week	13	44	31	88
	more than once a week	15	26	11	52
	Total	95	236	179	510

degree, never experienced e-shopping. 6.8% of them buy products online more than once a month but 18.6% made shopping trip once a week. 14% of people that have Master or PhD degree and 33.7% of people that have diploma or lower degree, never experienced e-shopping. It is noted that the group of people with Master or PhD degree buy more online.

**CONCLUSION**

Studying ICT, its branches (e-shopping, teleworking, etc.), and its effect on transportation system has begun in Iran for some years (Tehrani and Karbassi, 2005; Tehrani et al., 2009, 2010). The use of this technology is gradually increasing. 510 questionnaires were collected in Tehran (the capital city of Iran) to report the status of e-shopping and in-store shopping according to descriptive analysis in Spss23. As seen, although people still do not tend to use internet for shopping and often buy traditionally, it is possible to attract them to this shopping style (e-shopping) by increasing the number of internet shopping sites and extending their services and facilities that significantly

contribute to the reduction of shopping trips and traffic congestion in Tehran, especially during peak hours. As mentioned, if the traffic is reduced, travel time, energy consumption and air pollution will be decreased, people time and money will be saved and many of heart diseases, psychological stresses and physical fatigue will be eliminated. So one of the important strategies to reduce the traffic is encouraging people to shop their products online and not to use their saved time for generating unnecessary travels. Therefore, e-shopping may reduce shopping trips in future, although recent studies have shown the Complementary relationship between e-shopping and in-store shopping in Tehran (Edrisi and Ganjipour, 2016).

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## CONFLICT OF INTREST

The authors declare that there are no conflicts of interest regarding the publication of this manuscript.

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