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Structural Modeling of Effective Factors on Women's Satisfaction of Public Transport System (Case study: City of Kashan)

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Abstract: Women form half the population and many spaces in cities are used more by them. Women, as a large and active group, use the most possible of the system in cities due to their time constraints. Therefore, the special survey of their traffic patterns in urban public spaces and in particular, the public transportation and bus network of the city have a significant role in increasing the prosperity of urban spaces. The purpose of this paper is to investigate the factors affecting women's satisfaction from urban transportation system. Research method of in this study is descriptive-analytic. The data used in this study were collected through questionnaires and interviews. Then, using SPSS and AMOS software, the existing factors and structural modeling of these factors were investigated. The results showed that among the various indicators such as: services, equipment, seat quality, visual beauty, safety, social factors, security and behavior of the driver, the only factor of visual beauty, had a significant effect on women's satisfaction with the inter-city bus system and other factors with P value greater than 0.05, did not have a significant impact on women's satisfaction.

Keywords: Structural Modeling, Women's Satisfaction, Public Transportation, Security, City of Kashan
JEL Classification: N75, O18, J28, H55

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1- Introduction

Geographically, transportation is one of the most important human activities around the world. With the main role in spatial relationships between different situations, it is an integral part of the economy and has a valuable relationship between regions and economic activities and between human beings and the surrounding world (Rodrigue et al., 2009). In urban planning, transportation and communication networks with residential uses occupy the highest levels of urban space, and in addition to shaping the form and structure of the city, they play an important role in connecting and communicating space and urban utilities to each other. The traffic and transit system as a part of urban activities expresses the dynamism and life of a city complex. Undoubtedly, without moving, one cannot imagine a city vibrant and dynamic. In the systematic structure of a city, various activities require space, and activities are best done to have a suitable space in accordance with the type of activity. In the case of the transportation system, this space is nothing but a system environment that the transit network is also part of (Abibi, 2013). Urban transport system is an integrated system, with its components closely related. The success of this system is in the safety, connectivity and connectivity of its subsystems (Moeini, 2012). Today, transportation is associated with all aspects of life in cities. Leisure, education, trade, industry, and other aspects are among the basins that require a sustainable transport network in cities to link and build together with each other and to sustain the city's life cycle. Having a sustainable approach to the basin requires adapting and coordinating human activities with a climate of environments and avoiding contaminants, along with supporting dynamism and economic justice, along with vitality and social justice, as key dimensions of sustainable development (Litman, 2011). The reason for the importance of urban transport in the sustainable development approach is that the urban transport system is problematical with regard to its economic, social and environmental issues (Turton, 2006: 608). The use of high capacity passenger vehicles based on the greater passenger mobility of fewer cars, with different aspects such as congestion, air pollution, safety, fuel and energy consumption, and other options for transportation are preferred (cain et al., 2007). Therefore, the promotion of the use of public transport such as the bus has reduced the city's many problems, but an optimal transportation system should provide citizens with satisfaction. Assessment and evaluation of the quality of public transport services is a topic that has been in the past 15 years researchers. The World Bank publication, said that many challenges, including increased demand for transportation, match patterns of transportation standards and global consistency of communities with cars in public transport and satisfaction of the users of transport in the different countries are created (Zhou, 2012). Today, the major problems and disadvantages of urban transport are the economic, social and urban environments as the main indicators of sustainability, which has become more urgent for sustainability issues in this basin. Today's urban planning should reflect on the evolution of masculine and patriarchal cities and create urban spaces that are consistent with the needs of all its citizens. With this approach, cities will gain more urban

security, more participation and participation by women every day, creating economic, social and cultural opportunities, and the dynamics of the city's economy and increasing the beauty and efficiency of the city's spaces. Ultimately, we will have more stable, more humane cities (Ziyari & Turkamannia, 2013). In addition, today, bus transportation around the world does not indicate general satisfaction, bus services can be unreliable, uncomfortable and sometimes dangerous (Rezaei Aghamirlou, 2015). Therefore, measuring citizens' satisfaction with the bus service system will help to improve the quality of the system. There are also variations in patterns of movement between men and women in urban areas. Generally, men go further away to get to work, but women are in need of home and work responsibilities. This means women often have to travel their work other things like shopping or taking children to school and returning them. As a result, a significant number of women limit their employment opportunities to such multipurpose travel patterns. Gender differences is associated with the reality of lack of a car or a car for a family because men often use family cars in most cases that this makes women more likely to travel by public transport (because of limited access to the family car). The radial design of shipping lines also limits the selection of jobs for those who rely on public transportation (Pacione, 2009).

What is more important about women is the vulnerability of these people in urban spaces against the threats of the surrounding environment. Damage such as fear of violence and aggression, fear of darkness, physical harassment, intimidation, avoidance of privacy and insecurity (faczanch, 2006) threatens women. Therefore, attention to these peole in an urban space is of great importance. Meanwhile, women, because of their distinct characteristics, result in differences in urban space that space can be desirable for all groups and free from distress psychologically, in case of caring about these features (FaridTehrani, 2010).

Women are more likely to use intra-city bus transportation than men, so increasing their satisfaction with the system will improve urban sustainability indicators for public transportation and directly affect the sustainability of the city. The public transportation system in Kashan has many problems in terms of security, quality, order, access etc. The main objective of this research is to measure the satisfaction of women with the public transportation system in Kashan. To this end, women's satisfaction with public transportation was examined.

2- Literature Review

a) Foreign Researches

Eboli & Mazzulla (2007) examined the satisfaction of public transport users in Italy using structural modeling. They concluded that the weight of service planning and trust services such as design, comfort and convenience in the weight of passenger satisfaction is worth more.

According to Chen (2008), factors such as service quality, customer satisfaction, and value play an important role in user loyalty, the higher the quality of the user's loyalty service, and therefore their perceived value should increase.

Lai & Chen (2010), in a study using structural equation modeling to examine the behavior of citizens in public transportation in Taiwan paid to the conclusion that the service and the

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satisfaction of passengers of public transport plays an important role in this mode of transportation among citizens.

Verma et al., (2014), a research study in Bangalore, India, reviewed the quality of the bus and coach service system in Bangalor, India. They concluded that lack of proper infrastructure and management weakness has made it difficult for users of this system to meet the satisfaction of achieving a sustainable UN development.

Wan et al., (2016) studied the satisfaction of travelers from the New York City bus system using structural equation modeling. They concluded that the indicators of awareness and accessibility of travelers to travel information and upstream stations and speed have a significant effect on the satisfaction of passengers. Using the results of structural modeling of the routes inside and outside Manhattan, it is possible to increase the number of passengers on the bus lines waiting for him.

Hadiuzzman et al., (2017) in a structural modeling study; users' satisfaction with the quality of public bus transport was utilized through hidden and apparent variables in the city of Dhaka, Bangladesh. They concluded that in the operation of the Dhaka bus system, the variables of traffic experience, service the regularity and overall quality of the bus have the greatest impact and the least security impact on passenger satisfaction.

Chica-olma et al., (2017) examined the effect of the route on the perception of the quality of transportation services in Gradena, Spain. They concluded that the speed of the means of transport, the length of the route and the type of route had the greatest effect on the satisfaction of the passengers.

b) Iranian Researches

Rezayiaghamirlo et al., (2015) investigated passengers' satisfaction of urban fast-moving buses in Tabriz metropolis with emphasis on predictive models. Using the Kendall, Summers Day, Chi-square, correlation and regression statistics, they found that there was a significant and inverse correlation between education and the degree of satisfaction with fast-moving buses.

Ahmadvand et al., (2015) studied modeling the dynamics of sustainable urban transport system in order to improve traffic in Tehran. They concluded that if combined reductions in intra-city travel demand were achieved by improving the services of the public transportation sector, such as: safety and travel comfort, as well as coverage of travel routes, it would be possible to improve the traffic parameters, including the average speed of a private car, fuel consumption and environmental pollution in Tehran.

Hataminejad et al., (2014) examined users' satisfaction of public transports system in South Alborz area. Using statistical techniques such as factor analysis and regression, they analyzed the four factors of service, speed, behavior and physical characteristics of the bus, which the service agent played more important role in explaining the citizens' satisfaction.

Mirkatooli et al., (2013) investigated people's satisfaction of quality of services of public transport in the city of Gorgan-district 2. By examining a sample of 250 people, they found that the low cost and security presence was the most important reason for the people's satisfaction with the public transportation system.

Ziyari & Torkamanniya (2013) in an article entitled "The extent of women's

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access to the inland transportation system (Case study: Tehran 6th District)" argued that inter-city transportation was one of the main elements of the urban system that provides citizens with access to various city uses and situations. The results showed that 59 percent of women each day had an inter-city trip, with 59 percent doing all of their inland transit trips with public transportation. 60% of women preferred intercity bus and 24% taxi.

3- Theoretical Background

Urban Transport

Urban transport is an important part of the city's communications and transportation system, which aims to provide access and communication between different urban uses (Grava, 2007). Transportation of human and goods are of major economic and social importance for achieving the ideal quality of life indicators. Selecting a private vehicle or public transportation is a complex process that is affected by many factors. The characteristics of travel, travel time, trip order, demographic characteristics such as age, income, and income influence selecting type of vehicle (Ye et al., 2007). Basically, urban transportation is divided in three main categories which includes public transportation, personal transportation and transportation of goods. In this regard, the purpose of public transportation is to provide mobility and access in a specific section of the city. The efficiency of this form of transportation is due to the large number of people (Rodrigue et al., 2009). Today, the public transportation system needs to provide high-level services to better function and, as far as possible, be more accessible and serve more people (Häll, 2006).

For every person in urban space, traveling with a personal car is a great attraction because, compared to other transport options, it is easier, more flexible, faster and more livable in urban busy lifestyle. The personal car also symbolizes and reflects the social and economic identity of individuals. Inefficiencies and deficiencies in the urban transport system will have serious environmental issues, such as air pollution and negative social and economic consequences, resulting in inefficiencies in the functioning of the urban system (Hutchison, 2009). With regard to private car-based transport conditions, social, economic and environmental sustainability is not expected, and reducing demand for private cars in urban areas is key to sustainability. Efforts have been made to reduce the negative impacts of private cars in the world's cities, with solutions that include investing in developing less greenhouse gas equipment, planning for public transport infrastructure, a reduction in the distance between work and residence has taken place. The public transportation sector plays a key role in reducing air pollution and reducing the demand for non-renewable resources, including oil. The rapid growth of the use of private cars in urban areas has aggravated environmental concerns and social problems such as population density and lower general health (Redman et al., 2013).

Sustainable transport system means accessing all individuals and groups in a safe and consistent manner to human and nature health, providing the optimal and economical means of transportation and supporting economic growth, reducing greenhouse gases and minimizing non-renewable resources, land use and noise

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pollution to achieve sustainable levels (Gilbert et al., 2003). The reason for the importance of urban transportation in sustainable development is the problem of urban transport system considering its economic, social and environmental dimensions (Turton, 2006). Several indicators have been proposed to define the quality of public transportation, some of which are objective and some are subjective and perceptual. The comfort and convenience of riding a bus alone can be considered as an important aspect of the quality of the efficient service of the bus system, which can attract more passengers with appropriate strategies. Comfort has several sub-sets, such as seat comfort, congestion, and abnormal vibrations (Eboli et al., 2016).

The flexibility and affordability of an intercity bus system for all cities has a functional appeal, so optimizing the quality of the bus transport network will reduce traffic in the city and users of this system will increase. Since the urban bus system is the main part of the public transportation system, and even in many cities, the only means of public transport, it is expected to be such this for relatively long years. Therefore, it is essential to increase the level of service provided by this system through the implementation of technical and engineering measures (Namdari & Tangestanipoor, 2011). The bus systems create a diverse and inclusive form of flexible public transport that serves a variety of access needs in an unlimited range of locations throughout the city. Buses use urban streets and roads. For this reason, infrastructure investments that support bus services can steadily be much lower than the cost of capital required for rail systems. As a result, bus services can be cost-effective (Rezayi et al., 2015). Currently, the bus is one of the most important public passenger vehicles, due to its high flexibility and close proximity to car service in terms of service, it has a great deal of efficiency (Moghbel et al., 2014).

Table1. Satisfaction indicators of the Bus System

Main indicator	Sub-index	Definition
Physical	Frequency	The number of buses in the public transportation system
	Speed	The spent time of commuting between specified points
	Access	The threshold of public transportation services to individuals
	Price	Travel costs
	Providing information	Informing public transit routes to travelers
	Wasted time	Bus Expectancy Time
	Vehicle condition	Physical and mechanical conditions of transportation of public transport
Perceptual	Comfort	Comfort on travel with public transportation including seat comfort, cordial, air conditioning
	Safety	Safety in terms of accidents and passenger safety
	Ease	Public transportation services are to some extent prevented from the movement and additional travel of passengers
	Aesthetics	The beauty of the stations and the means of public transportation in terms of passengers

Source: (Redman et al., 2013)

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Woman and Urban Spaces

Urban spaces as a physical manifestation of the city should meet the social needs of citizens, provide the necessary means for accessing and providing the services required by the users, and provide conditions for all users, including men and women to enjoy the space. In Iran, due to various social, cultural, political, and other reasons, urban spaces are in a monopoly of men. Nowadays, mannish urban planning and unfavorable urban environments have led to a decrease in the enjoyment of women from urban public spaces and a kind of injustice in society. (Boromand & Rezaei, 2012). Although urban spaces are very large and inspiring, they are full of strangeness, insecurity and fear. For this reason, urban spaces often do not have the attraction for women than men. For this reason, many feminist writers are anti-city (Naghdi & Darayi, 2014). In comparison with men, women have different biological characteristics and responsibilities that affect their relationship with space. They expect certain facilities from space to fit their physical and emotional needs, and facilitate their everyday life and activities, but in urban spaces, men and their needs are the reference point for planning and regulating spatial standards. It does not pay enough attention to the needs of women (Poormohammadi et al., 2015). According to some experts, due to patriarchal domination, despite the expansion of economic activities and the full participation of women in social, cultural and economic affairs, which requires their active presence in the city and urban public spaces, no attempt is made to create their favorable urban spaces in the community or the fitting of existing spaces have not been made and studies have been conducted to determine the extent of women's security in the city (Hajiahmadi et al, 2015). Considering urban public spaces as the realm of communicating social interactions and human activities without any discrimination, today's cities do not follow the pattern of all social groups and women do not have the necessary comfort in these spaces. In researches that generally investigated the differences between women and men in the review of the use of public transportation such is stated: Women are more affiliated with public transportation than men are, and they have less privately owned cars, and in our country they do not use bicycles for normative and security reasons. In addition, most pedestrians are women; moreover, women do more journeys that are complex. Women tend to be more likely to use public transportation. Some studies show that women who live alone have more mobility in the use of public transportation (Scheiner, 2006) (Páez et al., 2007). Some research suggests that women use public transport more than men for travel purposes other than commuting (Kuhnimhof et al., 2006). In most cases, men in the family have a driver role, which this gender difference shows that men in their lives use much more than their own car, and vice versa, women are much less likely to use the car (Hjorthol et al., 2010).

4- Research Method

The research method in this study is descriptive-analytical. The main part of the data used in this research has been collected through fieldwork of the questionnaire and interview. Then, using SPSS and AMOS software, the security analysis and its role in women's satisfaction with intra-city transportation system was

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analyzed. The Cochran formula was used to determine the sample size. Since the population of women using the inner city bus system of Kashan is not known, the Cochran formula is used for a situation in which both the size of the population is unknown and the variance of the prototype is not available. The following formula was used to determine sample size:

$$x = \left(\frac{z_{\alpha/2}\sigma}{\varepsilon}\right) \quad \sigma = \frac{\max(xi)-\min(xi)}{6}$$

Since the five-point Likert scale questionnaire has been used, the largest value is 5 and the smallest value is 1. Therefore, the standard deviation is equal to 0.66. This value is the maximum standard deviation (Momeni & Ghayoomi, 2008). The confidence level is 95% and the accuracy of the estimate is 0.01. Therefore, the sample size is equal to:

$Z\alpha/2 = 1.96$, $\varepsilon = 0.01$, $\sigma = 0.66 \Rightarrow n = 170$

The validity of the research tool was determined by the content and face emphasis of the questionnaire by experts and university professors. The reliability of the questionnaire was calculated by Cronbach's alpha. Since the reliability of the researcher-made questionnaire is equal to 0.716, it can be concluded that the reliability of the questionnaire is desirable. Another part of the required data, such as theoretical-conceptual framework of research, documents, has been obtained through library methods and referring to relevant organizations. The research questionnaire was completed in 39 items. After collecting the data of the research questionnaire and performing confirmatory factor analysis, the sub-indicators and main indicators were prepared in 29 items, that the share of each of the main indicators is three items in each security, social, seat quality and safety index, respectively. The visual beauty indicators, equipment and services each have 4 positions and the behavior and behavior index is 5 items.

Then, using structural equations modeling, the effects of independent variables on dependent variables were investigated. Structural equations modeling of is the second-generation of statistical analysis technique used to analyze the interrelationships between multiple variables in a model (Keshavarz, 2014). Analyzing covariance structures or causal modeling, or structural equation modeling, is one of the main methods for analyzing complex and multivariate data structures whose main characteristic is the analysis of the coexistence of independent and dependent variables (Kirschkamp, 2008). This method is a set of statistical methods for modeling the relationships between independent and dependent variables (structural model) and hidden and observable variables (measurement model) (Mohsenin & Esfidani, 2017). In the Structural Equation Modeling Technique, the researcher, by observing and calculating the simultaneous variations (common variance) of several variables, intends to conclude that it is likely that the joint factor explaining these changes simultaneously. In fact, the common variance in an index is part of a variance that is shared with other indicators and is explained by one or more factors (Alavai, 2013). The indicators used in this research include a set of objective and mental criteria that affect women's satisfaction. The mental factors include driving behavior, social, safety and security; physical factors include equipment, services, visual aesthetics and the quality of the seat of the bus.

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The Study Area

The city of Kashan is located in the center of Kashan with coordinates of 51 degrees and 27 minutes longitude and 34 degrees latitude. This city is located in the cities of Aran and Bidgol, Ghamsar, Niasar, Ravand and SefidShahr.

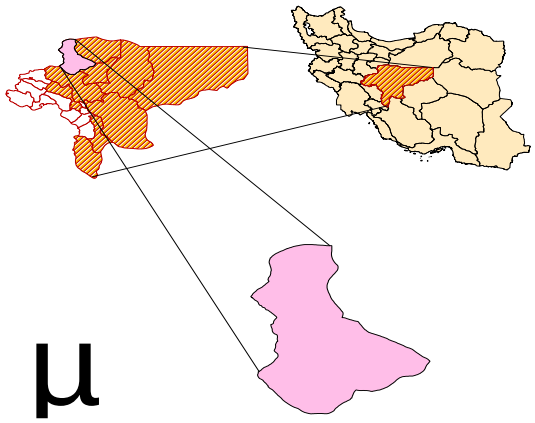


Fig1. Geographical location of Kashan City

5- Results

In the structural model of the research, the effective factors on women's satisfaction with public transportation (bus) in Kashan have been investigated (Fig1). Latent variables such as security (feeling security on the bus, security feeling at the bus stop, safety in the bus compared to taxi), social factors (social relationships on the bus and station and meeting relatives and friends), equipment (variety of advertising and entertainment, standard canopies of stations, ventilation system, physical barriers for the separation of women and men), driver's behavior (observing the time and order of the bus, the driver's attention to the speeds and bumpers, drivers' attention to the rights of passengers, driver's supervision to the behavior of passengers), safety (child safety, safety when getting off, last seat safety), visual beauty (noise pollution, bus beauty), seat quality (free seats, seat belts, material and seat quality), as well as services (satisfaction of electronic payment, green space around the stations, trash bins, general services). In the explicit variable of research (intra-city transport), the effect of each of these variables was explored in the obvious variable. The results showed that visual beauty and driver's behavior on the bus transport system of Kashan inland has caused the dissatisfaction of female citizens in this city. In this model, the effects of the latent variables of the social factors set are 0.08, security factors 0.03, service factors 0.02, and safety factors, driver behavior, equipment, visual aesthetics and seat quality, respectively, with weights of 0.09, 0.38, 0.05, 0.50 and 0.15 have had a significant effect on the overall satisfaction of female citizens with public transportation, which is referred to the weighting regression table for meaningful determination (Table2). The model was corrected with two-way communication and high correlation between security and driver's behavior, as well as visual beauty and equipment, and the quality of the seat and services.

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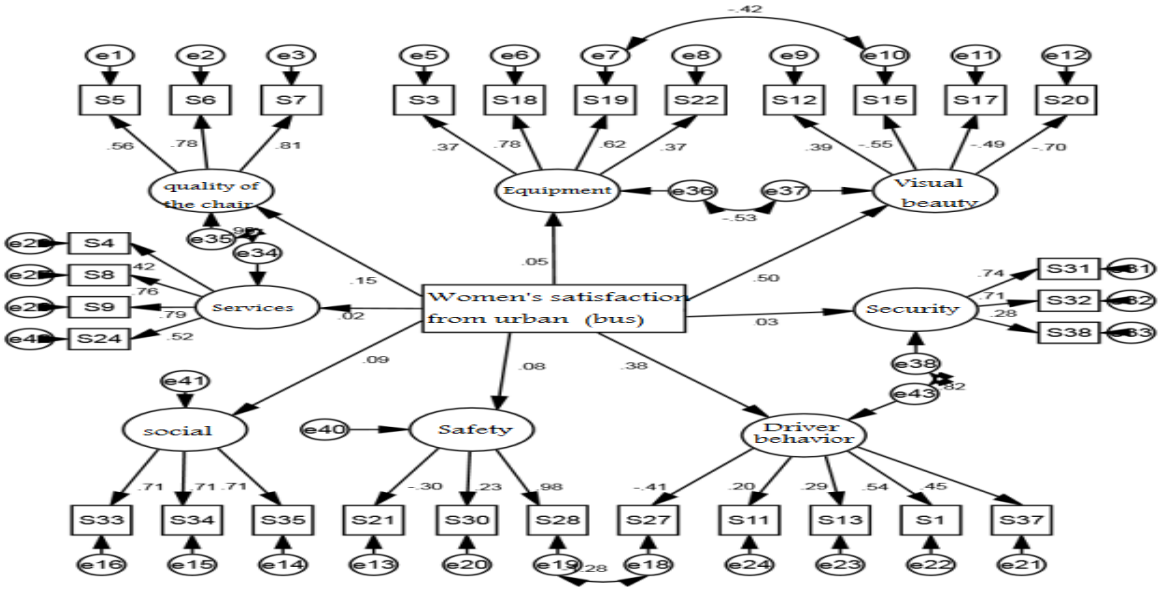


Fig2. Structural model of the effect of different variables on women's satisfaction with intra-city transport

In the structural model of research, women's satisfaction with the inter-city bus system as dependent variable and equipment, seat quality, visual aesthetics, safety, social, driver behavior and security as independent variables of the model have been introduced that affect the degree of satisfaction. According to Table 2, the significance level of the effect of safety, social and service indicators on satisfaction with the quality of public transportation was 0.754, 0.287 and 0.774, respectively (P value> 0.05), indicating that there is no significant relationship between these indices on the dependent variable of the research. The only latent variable is the visual beauty that affects the quality of transportation, with two-way communication and high correlation between this index and the indicators of bus system equipment. By improving the variables of this index, it would be possible to improve the relative satisfaction up to 43% in the overall satisfaction of the urban transport system. The highest weight among the sub-indicators of hidden variables were seat quality, equipment, visual beauty, safety, driver behavior, safety, social and service, respectively, the apparent variables of seat belt, ventilation system, bus atmosphere, bus station security, observance and order of buses, safety for getting off, visits to relatives and friends, and the presence of trash cans and station and bus cleaning. Generally, three main explicit variables that have the most impact on the dependent variable of research are as follows: the dull space of the bus factor with the factor weight of 0.346, noise pollution with factor weight 0.274, the apparent beauty of the bus with the factor weight of 0.224, and observing driving time by bus drivers with a weight of 0.207, which, with the expectation of change, explain the extent of women's satisfaction with the urban transport system.

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Table2. Weighted regression of the default model

Indicators	Abbreviation	Variables	Non-standard estimation	The standard error	Critical ratio
Security	s31	Feeling secure at the bus	1.00		
	s32	Security and bus station	1.157	0.204	5.679
	s38	Bus Security Compared to Taxi	0.518	0.170	3.054
Social	s33	Social relationships with others inside the bus	1.00		
	s34	Meet relatives and friends	0.956	0.146	6.533
	s35	Social relationships with others at the station	0.836	0.128	6.533
Visual beauty	s15	Noise pollution	-1.732	0.451	-3.840
	S12	Light and brightness	1.00		
	s17	The apparent beauty of the bus	-1.417	0.389	-3.643
	s20	Anxiety of bus atmosphere	-2.125	0.521	-4.080
Services	S4	Satisfaction with electronic payment	1.00		
	S8	Green space on the route and the stations	2.550	0.499	5.112
	S24	General service	1.526	0.347	4.398
	S9	Trash and cleaning	2.430	0.471	5.165
Equipment	S3	Variety of advertising and entertainment	1.00		
	S19	Standard canopies of stations	2.528	0.659	3.838
	S18	air conditioning system	3.114	0.802	3.885
	S22	Physical barriers for separating women and men	1.430	0.460	3.108
Driver's behavior	S1	Observe the time and order of the bus traffic	2.281	0.118	2.041
	S11	Driver's attention to speed and bumpers	1.00		
	S13	Driver's Attention to Traveler's Rights	1.657	0.932	1.797
	S27	The driver's harsh behavior	-2.125	0.521	-4.080
	S37	Supervision of the driver to the behavior of the passengers	2.333	1.172	1.991
Seat quality	S6	Free space of seats	1.252	0.181	6.927
	S7	Seatbelt seats	1.503	0.214	7.020
	S5	Material and quality of the seats	1.00		
Safety	S21	Last Seat Safety	-1.752	0.703	-2.493
	S30	Child Safety	1.00		
	S28	Safety when getting off	5.263	5.237	1.005
Satisfaction with the inner city bus system	Latent variables	Security	0.016	0.051	0.314
		Safety	0.014	0.027	0.498
		Seat quality	0.098	0.058	1.702
		Social	0.070	0.066	1.066
		Services	0.009	0.031	0.287
		Driver's behavior	0.071	0.038	1.883
		Equipment	0.014	0.027	0.498
		Visual beauty	0.173	0.047	3.670

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The fitting of structural models is done in both general and partial fit. According to Table 3, the non-nominal Chi-square Index (CMIN) is 919.963, which gives a significant result. The ratio of the Chi-square to the degree of freedom, which is called CMIN / DF, is equal to 2.314, which indicates an acceptable status for the model and the RMSEA value is 0.89. The good fit index of CFI is 0.0624, which is considered as the optimum value for the above model. Also in Table 3, the value of the Normal Fit Index (PNFI) is 0.450. The GFI value is 0.747, which indicates that the model has a satisfactory status.

Table3. Model indicators of goodness of fit

Index	Signs	Model		
		Main	Saturation	Independent
Parameters released to formulate the model	NPAR	72	465	30
Chi-square	CMIN	919.963	0.000	1834.761
Degree of freedom	DF	393	0	435
Significance level	P	0.000		0.000
Relative chi-square	CMIN/DF	2.341		4.218
GOF	GFI	0.747	1.000	0.516
Adaptive GOF	CFI	0.624	1.000	0.000
Normal fit index	PNFI	0.450	0.000	0.000
Adaptive fit index	PCFI	0.563	0.000	0.000
Root Mean Squares Estimated Error	RMSEA	0.89	-	0.200
Probability of fitness	PCLOSE	0.000	-	0.000

6- Conclusion and Discussion

Women constitute the majority of pedestrians, and they are drivers or own a car less than men do, and are often with children. From time to time, they are generally afraid of night trips and schedule their trips as avoiding after the darkness. In this case, planning for the identification and analysis of the model and the needs of women's movement is of particular importance and in the long run, it will increase the quantity and quality of using urban spaces and the actual and effective presence of women in cities. Given that women are generally much more dependent on public transport than men, and on the other hand, due to the proximity of the study area with bus and train stations, this can have a huge impact on the attraction of the population and their sense of security in the presence of the safety and efficiency of public transport. Different social and physical indices were measured in order to satisfy more women in public transportation. The latent variables such as security, social factors, safety, and driver's behavior were investigated as subjective variables. Other latent variables such as beauty and visibility, service, equipment and quality of seats and interior furniture of the bus identified as objective or physical factors and effect of each of these variables were explored in the obvious variable.

The results indicated that visual visibility of the bus and the intercity carriage station of Kashan had the greatest impact on the dissatisfaction of women citizens with the bus system in this city, and other latent variables had no significant effect on the independent variable. Although the latent variables of the driver's behavior with the weight of 0.38 affects the dependent variable, the

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significance level of this variable is 0.060, indicating that it cannot be approved with 95% significance level. This means that scheduling and speed of buses, security, green spaces, and behaviors of the drivers have no significant effect on citizens' satisfaction with the bus system. Given the structural model and the relationship between latent and obvious variables, it can be concluded that by increasing the visual beauty of the bus and the transport stations, a value of 0.5 is added to the satisfaction of the female citizens. Therefore, improvements in the quality of the environment and the urban transportation environment (bus system) have a great effect on the satisfaction of women. Improvement variables include reducing pollution, improving the quality of bus space and increasing the diversity and beauty of the entire bus system. Among the obvious variables involved in the structural equation model, respectively, variables such as busy noise, noise pollution, apparent bus appearance, and bus driving time were the most frequent with the expectation of changing the satisfaction rate of women of inland transportation system. The dull space inside the bus, light and brightness, smell, the arrangement of the seats and the extent of the visitor's visibility is not favorable due to the position of the female citizens in the second part of the bus. The noise pollution due to the location of the bus engine in the deployment of women is the main cause of noise pollution, which is a double problem because of the weakness or lack of a suitable ventilation system and open windows of the bus as a result of the noise pollution of the streets.

In order to improve the physical quality of the bus system in Kashan, the following suggestions are provided for the indicators studied:

- Increasing the number of public transport bus vehicles
- Modernization and improvement of the quality of the bus fleet in order to reduce the noise pollution
- Improvement of the ventilation and cooling system of city buses
- Eliminating busy and depreciated buses
- Preventing ads on bus stops and create obstacles in the visibility of travelers
- The optimal design of the entrance and the bus stops so that the elderly, women and children can easily get on the bus
- Installing children's chair and safety devices to prevent the injury of women with children on the bus
- Specifying a place in the bus to put women's stuff because many women use city buses to shop daily for retail outlets and stores
- Improving the quality of glass surfaces and bus windows to reduce noise pollution
- Periodic service of buses in order to reduce noise
- Insulate and create a noise barrier between the bus engine and passenger cabin
- Installing curtains adjacent to the windows on the section used by women
- Improving seat buses and living space
- Improving green space around bus stations
- Making diversity and beautifying the cabin of bus passengers

7- References

Ahmadvand, A.M., Mohammadyani, Z., & Khodadi, H. (2015). Dynamic Modeling

[Downloaded from iueam.ir on 2026-11-12]
[DOR: 20.1001.1.23452870.1397.6.22.8.1]
[DOI: 10.29252/iueam.6.22.123]

of Sustainable Urban Transport Systems to Improve Traffic. *Journal of Management Researches in Iran, 19*(2), 31-52. (In Persian).

Alavi, M. (2013). Structural Equation Modeling in Research on Health Sciences Education Introduction of the method and its application. *Iranian Journal of Medical Education, 13*(6), 519-530. (In Persian).

Borumand, M., & Rezayi, S. (2012). Evaluation of the Functioning of Women's Gardens in Increasing Women's Selective Participation in Urban Spaces (Case Study: Bostan Azadegan, District 15 of Tehran). *Quarterly Journal of Women Study, 7*(2), 43-61. (In Persian).

Cain, A., Darido, G., Baltes, M., Rodriguez, P., & Barrios, J. (2007). Applicability of TransMilenio bus rapid transit system of Bogotá, Colombia, to the United States. *Transportation Research Record: Journal of the Transportation Research Board*, (2034), 45-54.

Chen, C. F. (2008). Investigating structural relationships between service quality, perceived value, satisfaction, and behavioral intentions for air passengers: Evidence from Taiwan. *Transportation Research Part A: Policy and Practice, 42*(4), 709-717.

Chica-Olmo, J., Gachs-Sánchez, H., & Lizarraga, C. (2017). Route effect on the perception of public transport services quality. *Transport Policy*.

Das, R. (2015). Sexual Harassment at College Level-An Ongoing Gender Issue: A Study on Some Colleges of Purba Medinipur under Vidysagar University. *International Journal of Research in Economics and Social Sciences*, *5*(7), 32-45.

Eboli, L., & Mazzulla, G. (2007). Service quality attributes affecting customer satisfaction for bus transit. *Journal of public transportation, 10*(3), 2.

Eboli, L., Mazzulla, G., & Pungillo, G. (2016). Measuring Bus Comfort Levels by using Acceleration Instantaneous Values. T*ransportation Research Procedia, 18*, 27-34.

FaridTehrani, S. (2011). *Fear in urban space.* Tehran: Armanshahr. (In Persian).

Gilbert, R., Irwin, N., Hollingworth, B., & Blais, P. (2003). Sustainable transportation performance indicators (STPI). *Transportation Research Board (TRB), CD ROM*.

Grava, S. (2007). Urban transport in the Baltic republics. *The Post-Socialist City*, 313-343.

Habibi, K. (2013). Assessing global transport experiences and interventions in ancient urban textures with emphasis on pedestrianization. *Scientific Research Journal of Iranian Architecture and Urban Planning*. 5, 33-48. (In Persian).

Hadiuzzman, M., Das, T., Hasnat, M. M., Hossain, S., & Rafee Musabbir, S. (2017). Structural equation modeling of user satisfaction of bus transit service quality based on stated preferences and latent variables. *Transportation Planning and Technology*, *40*(3), 257-277.

Hajiahmadi, A., Majedi, H., & Jahanshahloo, L. (2015). Investigating the Criteria for Increasing Women's Activity in Urban Spaces (Case study of Poonak neighborhood in Tehran), *Journal of Urban Studies*, 14, 47-60. (In Persian).

Häll, C. H. (2006). *A framework for evaluation and design of an integrated public transport system* (Doctoral dissertation, Institutionen för teknik och naturvetenskap).

Hataminejad, H., Poorahmad, A., Faraji, H., & Azimi, A. (2014). Measuring the Satisfaction of Users of the Public Transportation System in the South Alborz Region. *Journal of Urban Economics and Management, 3*(9), 105-123. (In Persian).

Hjorthol, R. J., Levin, L., & Sirén, A. (2010). Mobility in different generations of older persons: The development of daily travel in different cohorts in Denmark, Norway and Sweden. *Journal of Transport Geography*, *18*(5), 624-633.

[Downloaded from iueam.ir on 2026-11-12]
[DOR: 20.1001.1.23452870.1397.6.22.8.1]
[DOI: 10.29252/iueam.6.22.123]

Hutchison, R. (Ed.). (2009). *Encyclopedia of urban studies*. Sage Publications.

Keshavarz, Y. (2014). *Structural Equation Modeling Using Amos*. Tehran: Ketabe Mehraban. (In Persian).

Kirschkamp, A. (2008). *Contingency-Based View of Chief Executive Officers Early Warning Behavior*. Gabler (GWV).

Kuhnimhof, T., Chlond, B., & von der Ruhren, S. (2006). Users of transport modes and multimodal travel behavior steps toward understanding travelers' options and choices. *Transportation Research Record: Journal of the Transportation Research Board*, (1985), 40-48.

Lai, W. T., & Chen, C. F. (2011). Behavioral intentions of public transit passengers—The roles of service quality, perceived value, satisfaction and involvement. *Transport Policy*, *18*(2), 318-325.

Litman, T. (2011). Well measured: Developing indicators for sustainable and livable transport planning. *Victoria Transport Policy Institute*.

Maghbal, A., Azar, A., & Mirmehdi, S.M. (2014). Segmentation of Public Urban Transport Market Using Cluster Analysis (Case Study: Sixth District of Tehran). *Journal of Urban Economics and Management*, *2*(7), 35-50. (In Persian).

Mirkatooli, J., Mohammadi, F., Negari, A., & Shokri, A. (2013). A Survey on People Satisfaction with the Quality of Public Transportation Services (Case Study: District 2 of Gorgan). *Quarterly Journal of Urban Planning Studies*, *1*(1), 133-157. (In Persian).

Moeini, S.M. (2011). Access to public transit stations. *Journal of Manzar*, *3*(15), 62-65. (In Persian).

Mohsenin, Sh., & Esfandiyani, M.R. (2017). *Structural equations based on partial least squares approach with the help of Smart-PLS software (educational and applied) with CD*. Second edition, Tehran: Mehraban. (In Persian).

Momeni, M., & Ghayoomi, A. (2008). *Statistical analysis using SPSS*. Tehran: Ketabeno. (In Persian).

Naghdi, A., & Darabi, S. (2014). Women Access to Urban Spaces (Case Study: Women in Ilam City). *Journal of Woman in Culture and Art*, *6*(4), 461-470. (In Persian).

Namdari, R., & Tangestani, A. (2011). Modeling Bus Stop at Normal Bus Lines (Case Study of Abadan City). *Journal of Industrial Management*, *6*(17), 93-102. (In Persian).

Pacione, M. (2009). *Urban geography: a global perspective*. Routledge.

Páez, A., Scott, D., Potoglou, D., Kanaroglou, P., & Newbold, K. B. (2007). Elderly mobility: demographic and spatial analysis of trip making in the Hamilton CMA, Canada. *Urban Studies*, *44*(1), 123-146.

Poormohammadi, M., Khazrnejad, P., Ahmadi, P., & Jahanbin, R. (2015). The survey on the adaptation of urban public spaces to the needs of women in Urmia. *Journal of woman in development and policy*, *13*(1), 23-40. (In Persian).

Potter, S., & Skinner, M. J. (2000). On transport integration: a contribution to better understanding. *Futures*, *32*(3), 275-287.

Redman, L., Friman, M., Gärling, T., & Hartig, T. (2013). Quality attributes of public transport that attract car users: A research review. *Transport Policy*, *25*, 119-127.

Rezayi, M., Poorfathi, J., & Zali, N. (2015). Measuring the satisfaction of passengers from Urban Buses system in Tabriz Metropolis with emphasis on predictive models. *Journal of Urban Economics and Management*, *3*(11), 11-135. (In Persian).

Rodrigue, J. P., Comtois, C., & Slack, B. (2009). *The geography of transport systems*. Routledge.

Scheiner, J. (2006). Housing mobility and travel behaviour: A process-oriented

[Downloaded from iueam.ir on 2026-11-12]

[DOR: 20.1001.1.23452870.1397.6.22.8.1]

[DOI: 10.29252/iueam.6.22.123]

approach to spatial mobility: Evidence from a new research field in Germany. *Journal of transport geography*, *14*(4), 287-298.

Turton, H. (2006). Sustainable global automobile transport in the 21st century: an integrated scenario analysis. *Technological Forecasting and Social Change*, *73*(6), 607-629.

Verma, M., Verma, A., Ajith, P., & Sindhe, S. (2014). Urban bus transport service quality and sustainable development: understanding the service gaps. *Indian Journal of Transport Management*, *38*(2).

Wan, D., Kamga, C., Hao, W., Sugiura, A., & Beaton, E. B. (2016). Customer satisfaction with bus rapid transit: a study of New York City select bus service applying structural equation modeling. *Public Transport*, *8*(3), 497-520.

Ye, X., Pendyala, R. M., & Gottardi, G. (2007). An exploration of the relationship between mode choice and complexity of trip chaining patterns. Tr*ansportation Research Part B: Methodological*, *41*(1), 96-113.

Zhou, J. (2012). Sustainable transportation in the US: A review of proposals, policies, and programs since 2000. *Frontiers of architectural research*, *1*(2), 150-165.

Ziyari, K., & Torkamanniya, N. (2013). The rate of women's enjoyment of intra-city transportation system Case study of Tehran 6th district. *Urban and Regional Studies and Research*, *5*(19), 149-168. (In Persian).

[Downloaded from iueam.ir on 2026-11-12]

[DOR: 20.1001.1.23452870.1397.6.22.8.1]

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