

CASE STUDY

The Role of New Technologies in Urban Transportation Management

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ABSTRACT: Today, information technology, one of the most important strategic tools in the management and administration true human bodies. With the development in addition to the city and retreat of problems with respect to the consequences that the industry modernization and urban life. As well, every bit for the city dwellers living, the city is stable. Of the most important obstacles in the city, poor management of sustainable urban transportation systems and the creation of traffic congestion. Usually cities in the development of three elements of energy, transportation and information technology have a special significance. The present study, fell out with the aim of modern technology to control traffic and the volume of energy consumption in the city of Semnan is considered. The primary question to resolve whether an urban transport management process with respect to the role of new technologies in traffic control and the volume of energy consumption is efficient? Demographic research a number of people living in the town of Semnan that steps through the formulation of the questionnaire and analysis of the two descriptive and face the inference, Chi-square and Pearson and provide a conceptual model was carried out results of this research shows that the research hypotheses narrowly approved a new technology and intelligent traffic control and effective energy consumption and urban transport management is important, too. In regard to reflect this action in smart provide better planning of urban management and sustainable development through the metropolis.

Keywords: Modern technology, Traffic controllers, Consumption of energy, Transportation, Urban management

INTRODUCTION

With an increment of human population, cities, which were crowded and therefore, build up in cities and towns were bigger dimensions a many city metropolis. For this reason, the necessity of urban transport management more than earlier. Which is one of the most important strategic functions of the metropolis. With the emergence of information technology in the fields of human life, human life has entered a new phase. Swept all human beings that most of their computers and communications networks. Shortly afterwards that information technology's significant role in people's lives. The importance of the use of new technologies in the field of municipal services and the urban environment, moving towards a process of it as a smart service

activity in major cities across the country is of great importance. Today, the country's major cities have struck problems like air pollution, the traffic congestion and pollution, the effects of fossil fuels, life for the residents of these towns hard and quality of life of the residents of mega - cities greatly reduced. The current age, awareness, social literacy and electronic planning as the most important tools to urban planning system changes are known (James, *et al.*, 2004). New developments in information and communications technology and electronic equipment, causing new activities has proliferated urban (Narabokhshand, 2009). Good communication city and access to urban infrastructure is of great significance in the long - term development strategy is a city (Fernandez, 2005).

The metropolis is really systematic and is that you sustain a different force and interwoven with inter-

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actions and simultaneously in all its shapes and patterns. With respect to the underlying forces on the form of the city, and the importance of the impact of the content of ICT significantly for years from city to city will be different. But in generalities and public face of social and cultural factors affected communities. Social and cultural factors in terms of their local and internal attributes in proportion to the ICT system to interact with anatomically – probably did bias and development strategies space cities affected city (Mitchell, 1999).

Growing, developing information technology and widespread adoption in the new urban communities and everyday life of citizens, the concept of strategic importance and geographic concentration (services) also undergoing extensive developments. Contemporary cities as parts of a new form of life in the era of communications and fourth wave (virtual movement of empowerment due to focus and services, the maximum volume of economic and social interactions, at the highest level of the need to use new information and communications technology. Technology in the exploitation of the civilian administration as well as the effects of deep and developments in the areas of economic, social, cultural and environmental and would (Najad Javadi Part). Promote the use of information and communications technology in order to improve the mobility in dense urban areas, and road traffic conditions. Promote the use of information and communications technology in the implementation of a real-time management in public transport, causing more efficient services through the use of Smart control traffic lights and control the route, the use of electric vehicles (smart charge), smart transportation system with global standards (ITS).

(Call to Action on Smart, Sustainable, Cities, 2012)

Usually cities in the development of three elements of energy, transportation and information technology have a special significance. (See the figure below)

Currently the growth in our societies form is unstable and development, we have witnessed a steady out and we need to enhance the capacity of urban transportation systems, a constant need and is growing. Of these processes from one side of the quality of life threatening users of the car, so that more and more time in his car and depend on the car spend more on the one hand and the environmental quality also faced with the risk. Increased to mo-

tor vehicles, inadequate management strategies and inappropriate land use planning, traffic and transportation, caused a lot of traffic congestion in the density and increased urban travel time, additional fuel consumption, increasing the amount of pollution and worsening urban environment for the lives of residents and the situation is inconsistent with the principles of sustainable development. Hence, it is essential issue transportation and traffic was carefully studied and attention.

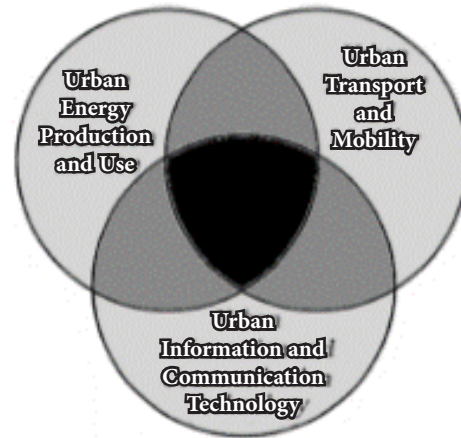


Fig. 1 the figure of relationships (Nils usakovs, 2014)

So the present study to examine the role of new technologies in the management of urban transportation and its role in the traffic control and the volume of energy consumption in Semnan. That in this regard first review the issue and expressed the theoretical research and literature review, and also in terms of fuel vehicles and traffic controllers and sustainability of transportation services in urban and intelligent use of transportation, traffic, and the use of new technologies... in this context analysis and evaluation.

In order to achieve the objectives of this paper that the role of new technologies and intelligent urban construction along with an urban transport management can be found in a traffic control and the volume of consumption of energy efficient, two basic question is currently being considered, in response to them.

Smart

1. Of urban and New Technologies what impact traffic control and reduce energy consumption.
2. Urban transport management process what the consequences of the City spares?

Thus, Hypothesis study: using new technologies and management with transport can traffic control and the volume of energy consumption in the city of Semnan creates. That continues to review its viability.

Theoretical foundations of research

1-2. Information technology

a series of IT technology tools for access to information, information systems and eventually forming a society and its greatest symbol in the current circumstances, the Internet (Shams, 2006).

Both cases and other tools for the phone, radio, TV, books and file files. So have said anything that society towards the use of computers and the internet, to ease, life, but the IT projects.

IT indicators

1. the number of computer and Internet users in a society and the coefficient on it.
2. the degree of access to fixed and mobile phones in society

2-2. Information and communications technology

Today, in line with the IT extension of information and communications technology to speak. In fact, the emergence and align information and communications technology (ICT) remains at the heart of the worldwide economic and societal change.

ICT sector consists of a lot of service industries and activities, including providing Internet services, service and equipment, telecoms, data technology, press, radio, commercial business information providers, information services on networks, and hence along. Today, The components and elements in the past, which were considered a separate activity, all in a bed and a series of the dimensions of the Information Society (ghaffari, 2003).

IT systems and equipment, including any interconnection (sub - systems) The equipment, which consists of each of the forms of technology used in the creation, storage, ordering, management, displacement, drama, switch, exchange, or transfer of information, in every possible way. The information may be different forms, including trade data, along with the sound, steady and moving images, multimedia displays, etc.

3- 2 Sustainable Transport, transportation, of course, is the biggest issue for discussions, environmental urban form (Jenks, *et al.*, 1996). City format largely reflects technology, transportation, often

in diverse phases of development. (Barrett, 1996), stability as reducing mobility and traffic is defined, Elkin, (McLaren and Heilemann, 1991), argue that The city should form a stable form and the appropriate scale of the sidewalk, cycling, and public transport would be efficient, Sustainable Transport as transportation services that reflects social and environmental costs.

4- 2 smart transportation systems

Today, with the development of science, engineering growing traffic in the world for many ways and means of traffic management. Transportation systems - inspired one of the most frequently used tools. The transportation systems in the conceptual smart new traffic engineering, which is a very important role in the security and transportation dynamics. The systems increase the efficiency and transportation network traffic, with Tehran in urban management can be many problems of transportation.

History smart transportation system (ITS) in transport Source comings and cars

Or background to the 1860 in London when a good light for the safety of members of parliament in an intersection near the parliament installed, the first to be the light today in years in Detroit, Michigan 1920 was used. The start of primitive, simple and control systems intersections, the panel of variable speed control systems, and etc.. Time to control

Traffic lights in elemental form with the timing of the fixed its control of the crossing today, according to a tally traffic and point in years in the United States installed systems using computers that time was planned.

Do its actually beginning in time for the use of Intelligent Systems was traffic control.

. The concept of smart transportation system (ITS) smart transportation system and use of new technologies such as electronics, communications, control systems and other advanced technologies, which is the displacement brought about safety, security and efficiency in the Department of Transportation and reform in connection with other measures to reduce the consumption of energy, environmental indicators including the air quality improved access to the means of transportation.

The transportation system in various ways to transport is generalizable using automated tools and planning, various types of operations and receive information processing and management. Traffic control

and transportation. In this system with human components in information processing or process control and improve the caliber of the management in the process of decision - making and management. (Ahmadi and Muharram najad, 2014)

5- 2 smart traffic

traffic dynamic set of different factors like a weatherman, cars, and etc. Human existence alone in an environment that someone has to change the decision, and generally available in a permanent change we are facing a lot of dynamics adds to the environment. The dynamics of the environment are solid and insecure environment for that decision and action. Dynamic environments in any region of the environment cannot remain unless changes in the environment or he could be flexible in front of it. Which could predict the future of the infinite, according to the plan. So with respect to human knowledge, flexibility, a better option. Flexibility, I. e. , the process of existing or changes favourable response. The response to changes in the behavior or feeling. Flexing in front of a system, the environment changes the aspect of intelligence. If the system in front of unwanted changes could show flexibility, more intelligence. Of what passed, it can be concluded that one of the characteristics of a system of the optimal control traffic, flexing in front of the environment and changes in the end of The intelligence. To see how the traffic control, an intelligent system. (Ali Pur, 2003)

Scooter and his colleagues interesting approach to the optimal control in a separate intersection.- an

intersection with four input and output four. In this way, L1, L2, L3, L4 shows the streets, entering the intersection. T 1, T 2, T, 3, T 4 represents the timing of the traffic. To simplify issue we assume that the traffic lights can only two red and green mode. To continue to need the variance.

Approach in the previous section was one of the few detailed models that the heap1 with math and science is required to control. With the above analysis can be concluded that only with a preciserates N entry and exit point in the next, the optimal control can be achieved by the high cost of processing and found that actually the dynamic nature of such an accurate predictions traffic with the increase if not impossible, too.

SCOOT, the first commercial traffic control system. 80 70

in the late 1980 s and early 90 s in research laboratories and transportation, and formed a British SCOOT optimization and focused on three levels: sector, offset, and the cycle. Sector time remaining green light every street. Offset the interval of time between the two meet for the intersection of neighboring coordinated activity is considered to be granted permission to pass, and the cycle of the streets. For the installation of a network parameters in the urban system needed to determine and be calibrated. SCATS model by the roads and traffic Australia develop Eddeh so and hierarchical distributed, with three - level. The architecture consists of computer observer in traffic control center in control of the reactors, regional and local controller's signal. Ob-

Period	T ₁	T ₂	T ₃	T ₄
t ₀ - t ₁	red	green	red	green
t ₁ - t ₂	green	red	green	red
t ₂ - t ₃	red	green	red	green
⋮	⋮	⋮	⋮	⋮

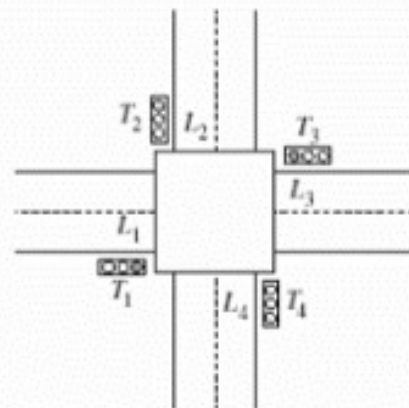


Fig. 2 (A)(b)
 (A) Meet with four two - way street (b) change light scheme guide
 (Hobeika,1994)

Under Dungy give	Model	The sight
Microscopic models	MIXIC	Van Arem, Hogema
	SIMONE	Minderhoud
	PELOPS	Ludmann
	safe-distance model	May
	stimulus-response model	Leutzbach, May
	Psycho-spacing models	Wiedemann
	FOSIM	Vermijs
	CA-models	Nagel, Wu, Brilon
	Particle pedestrian model	Hoogendoorn, Bovy
Mesoscopic Models	INTEGRATION	Van Aede
	headway distribution model	Hoogendoorn, Bovy
	reduced gas kinetic models	Prigogine, Herman
	improved gas kinetic model	Paveri-Fontana
	multilane gas-kinetic model	Helbing
	multiclass gas-kinetic model	Hoogendoorn, Bovy
	multiclass multilane gas-kinetic model	Hoogendoorn
Macroscopic models	Cluster Models	Botma
	LWR Models	Lighthill, Whitham
	Payne-type Models	Payne
	Helbing-type Models	Helbing
	Cell-Transmission Models	Daganzo
	METANET	Kotsialos
	semi-discrete model	Smulders
	FREFLO	Payne
MASTER	Treiber	

Table 1 models traffic raised

server's computer central to the computer access to data and traffic surveillance. (Hoogendoorn, 2000) The spatial distribution of urban roads will emerge from a variety of applications, poor townsfolkfactor in traffic jams. Applications factor in traffic, he can be divided into three categories: - factor for traffic control traffic - factor for the simulation - traffic factor for information.

Software simulator, simulation software is based on three components: cars, crossing the street. The source and destination trips, intersections. Source of travel production at the simulation is an intersection. Figure this function to meet with a density. Every intersection with predetermined rate. The production rate is a function of the type of housing junction, administrative, social and ferry), and the density of second traffic production, and the amount of car production calculated relationship.

Density intersection \times parameter adjustment \times the production rate + remaining = production of the current traffic

Which is the remaining vehicle that was already producing (but for some reason, such as less than one or the occupation is not the way I production). Parameter setting provides for the adjustment is produced. That assessment in the amount of this parameter is 4. In producing cars, the intersection of its destination. Market intersection. Destination intersection, based on the type of manufacturing cars and time, the source and destination for density. For example the cars produced at the intersection of residential before the hour: 40 % 90 16 before the possibility of the intersection of administrative and the possibility of 10 % to the intersection of sport and then to % 90junction of the possibility of sport and 10 %, the probability of administrative intersection. Like the same rules for administrative and entertainment intersections at the pub. The passageway no traffic intersection of production and No. (Hidas, 2002) Cars before reaching the intersection in terms of being closed or open to attempt to bring order to speed believes at the intersection, I. e. M 4 or standing to

stop inline reduction. Cars to cross the intersection closest to his time at the intersection of the occupation and spent it. (K. G. Anagnostakis, 2000)

6- 2 sustainable energy

to achieve sustainable energy for all. 2030 year for us to overcome poverty and save the planet can, and should, to achieve this goal is to take action by all countries and all sectors need for the decisions related to investment and policy for the future, the brightest in the field of energy is necessary. Industrial countries must be transferred to the production technology of harmful gases less. Developing countries, many of them on a large scale and speed are growing, it is possible to have the choice of the traditional relating to energy, to benefit other choices cleaner energy growth and increasing economic and social development, will be. Related cause three goals, according to achieve sustainable development constitute for all.

* Ensuring universal access to modern energy services 2 - doubling in than to improve energy efficiency 3 - doubling renewable energy's share in the global energy mix.

The three goals, each of which, in turn, in many cases, it is important to strengthen each other, renewable energy technologies that day to day more affordable.

A change in technology has caused the old goals and everyone in many areas, including energy, on the eve of the realization. Achieving sustainable energy for all ambitious realizable goal, but with the rapid development of the technology of the day - to - day finances are enforceable.

A sustainable energy initiative for all is necessary action by all stakeholders in the area of support for access to energy, optimize energy and increase the contribution of renewable energy and identification. In order to organize the efforts of a new high - level group in the context of sustainable energy for all, led by Canada Yuomecla, president of the United Nations (UN) - energy and director general of the United Nations Industrial Development Organization, and Charles Holliday, governor of the Bank of Energy form.

DuPont the United States and the former chief executive manager of the group's urgent task advice to move the schedule will be based on all stakeholders can contribute it.

Countries such as China, India, Nepal, Brazil and South Africa are also leading the way national ini-

tiatives. At the same time, the global agreement and UN Country Teams in the relevant countries will try to public - private partnerships with investment facilities to increase speed and progress. (Of the UN General Assembly meeting)

7- 2 energy – saving

Energy at the apex of the pyramid sustainable development. Energy without any work and there is no activity. Bugaboos energy consumption in the world in the Department of Transportation inter - city about 12.5 %. Of course, this was not fixed in all countries, and it appears to be more specific situation in Iran, energy consumption for inter - city transport Over the average 12.5 %. promotehike in cities, especially in the short distances and in urban centers can do to reduce the consumption of energy from fossil fuels and share in the cities of transportation and energy consumption to significantly reduce bugaboos. Consequently, developing countries due to the low - income categories of cities to promote the use of means of transport non - motor is more affordable. In Cairo, who have been less income of due to the impossibility of energy supply-bugaboos required the use of non - motor vehicles. The final result in developing countries due to the low national income of less energy resources, promotes the use of means of transport and non - foot on one of the ways of achieving sustainable development in cities.

(Krier Rob, 2010)

I. e. The presence of transport and traffic, and its relationship with the sustainable development of the cities of policies related to urban transportation, urban land for the use of land for the facilities and transportation facilities directly and due to the influence on access to land and as a result of the urban development, indirectly affected.

In a as a conceptual model well as conceptual model, and the research process as follows:

The study area church

Semnan province as the city center is Semnan from the north, with summarized and mahdishar cities from the west and east of the city of the sorkkeh city in connection with dungeon and its distance to Tehran 216 km.

The town of 1460 meters above sea level and has a public slope of north and south. Area of the city limit its, according to the city of 2616 hectares and privacy. 1390 in the city's population census amounted

Fig. 3 cycle number depends on the car

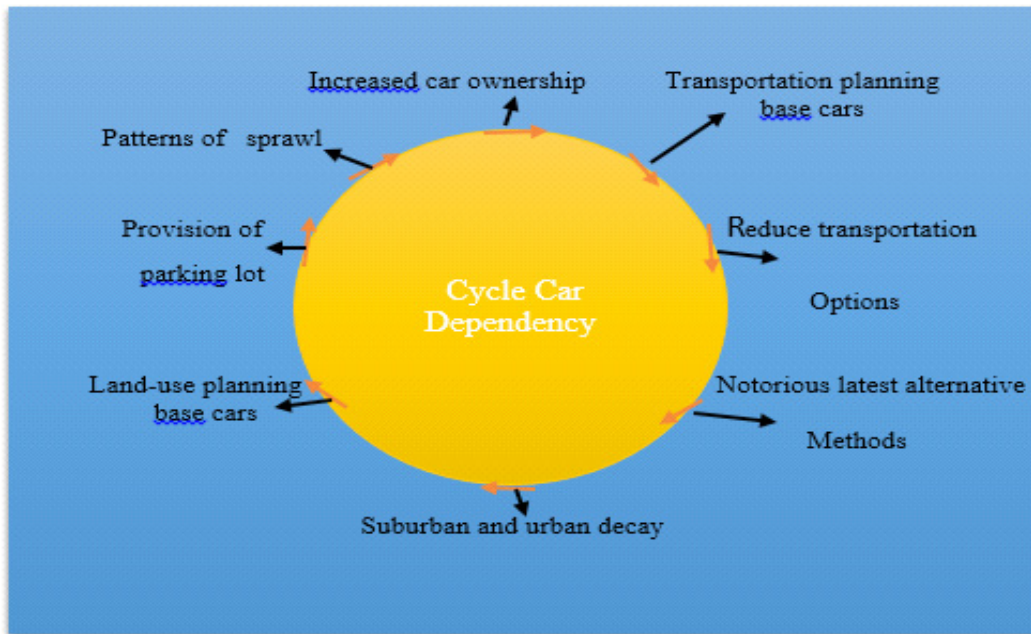
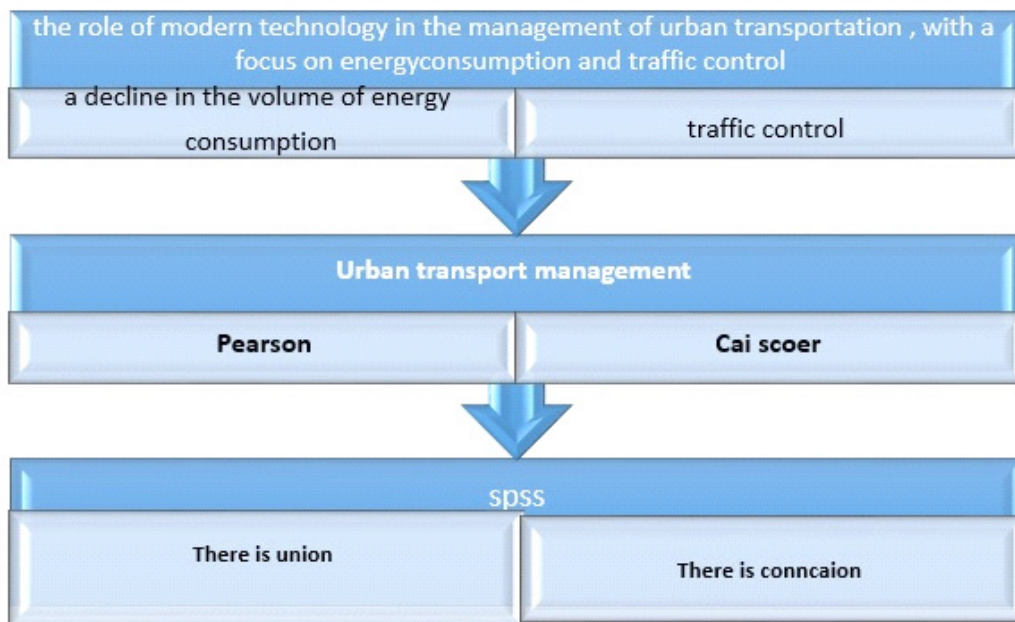


Fig. 4 : the pattern and conceptual model research



to 153680 people (Statistical Yearbook Semnan, 2012).

New Technologies management strategies to achieve a traffic control of urban transport **and energy consumption**

Reduce the negative effects of the transport and traffic on the life of urban dwellers, needs to move towards

the transport is stable and sustainable transportation systems need dynamic balance between three basic pillars of sustainable development, environmental protection, equality, social and economic efficiency for present and future generations. (tikhabahmed, *et al.*, 2007) to achieve the goals of the long - term solu-

tions and interest in the short term, but this is important to note that the pursuit of short - term solutions should not undermine the long - term solutions and refer them to the bush.

Will meet with the environment and social equity, which aims to optimize the use of transportation systems to achieve economic, social and environmental concerns without the ability of future generations to achieve similar objectives, to destroy “the expression as far as possible. The use of technology, communications and computers (such as software, route optimization, telecommunications and projects such as e-government and electronic city (Alikhanzadeh, 2007) using efficient means of transport such systems, public transport, promotes walking and cycling, maximizing the efficiency of all used vehicles (cars only) provision of car parking in management, housing, use of renewable energy sources, reduction of capacity and the availability of parking lots and streets. They compared the environment, we: (Gunter Emberger, 2007) In terms of space consumption: According to a study conducted in Austria in a case study, a car is 60 times higher than pedestrian need extra space. Figure Therefore, any policy transport a person instead of moving by walking to car use will encourage the use of space (one for one) in a city of 60 square meter increases and this can be a significant impact on the future structure of the city.

In terms of energy consumption: According to the study, to relocate walk through, no external energy (not to produce and not for use) is not required. To travel by bicycle, only the energy required to produce it must be considered. Travelling by car also needs to produce 4 mg and 21.8 mg is to apply. Any policy that human behavior is to use the car to

use the public transportation system change, saving fossil energy 19.3 mg, reduce noise pollution, air pollution, greenhouse gas emissions and the cost of road crashes. (As shown below)

Short-term strategies

Including the following can be cited: Forbidden range of regional, off-limits belt, prohibition corridors, the concepts of dynamic parking fines based on the amount of use, the possibility of free rental of bicycles in the city center, restricting access, car-free days, use of new technologies to solve traffic problems in the city 6. (As shown below)

For instance, some of the new technologies in the management of urban transportation offered in the city of Semnan.

- * Manage time traffic lights: LED smart guides using sensors to detect the traffic on the streets and crossroads.
- * Intelligent management of traffic: car navigation system using low-traffic routes Snsvryng network has been launched in the city
- * Manage energy efficiency in the city: by installing sensors detect the presence of the walkways and parks, street lighting can be managed in a way that is in the presence of lights.
- * Consider energy efficiency in the buildings of the city: you can apply the necessary legislation in the construction, use of some essential items in smart homes and buildings in the city as mandatory to implement.

the research methodology

The kind of investigation into the qualitative and quantitative, which is due to the nature of the issue, the ruling approaches the descriptive research

Fig. 5 urban space consumed by vehicles

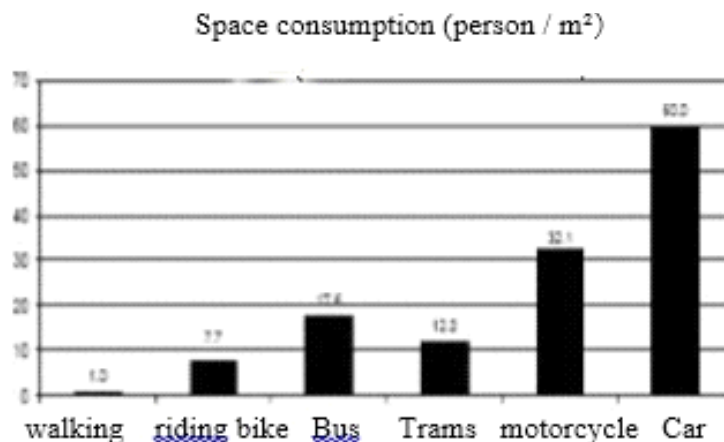


Fig. 6 energy consumption by vehicles

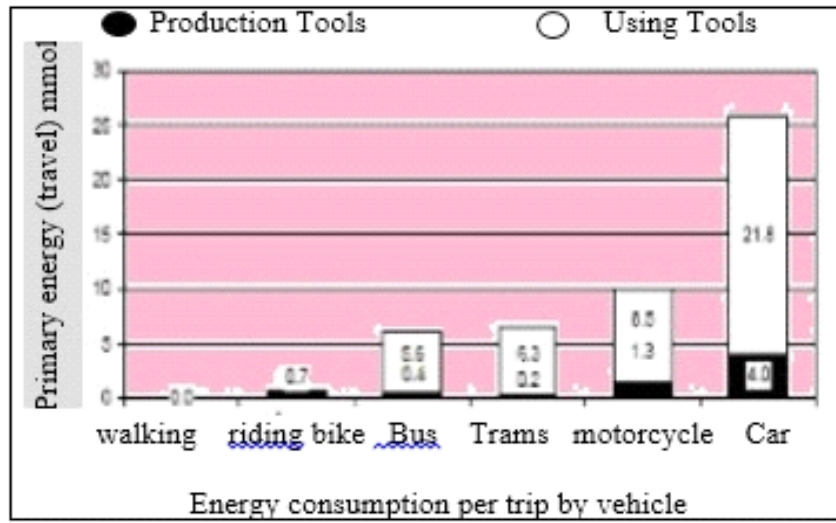


Fig. 7 prohibition and restriction of entry of vehicles of various projects aimed at reducing access to urban centers and to sustain the urban environment



Pic 1 intelligent traffic management



Table 2. Calculation method weighted average number index 1 questionnaire

The weighted average index (Score)	The total weight of the index	The frequency options					The number of respondents	Index
		1	2	3	4	5		
1647/383=52/4	85×3+98×4+200×5 =1647	85	98	200			383	Traffic (smart)

Source: author / research Findings/ 2015

Fig 8 to determine the spectrum desirability indicators

	Undesirable	Relatively favorable	Favorable	
5		5/3	5/2	1

Table 3. Quantitative analysis and determine the desirability indicators

Quality Index			Score	Indicators (measures)	Component (variable)	Concept
Unde- sirable	Relatively favorable	Favor- able				
		*	52/4	Make smart	The traffic	Smart urban services
		*	56/4	Reduce commuting		
		*	30/4	Avoid traffic		
		*	52/4	Traffic control		
		*	15/4	Transportation management	Trips within the city	
		*	08/4	Reduce commuters		
		*	41/4	Streamlines the process of urban management		
		*	26/4	Reducing energy consumption	Energy consumption	
		*	13/4	Lower fuel consumption		

Source: author / research Findings/ 2015

Table 4. Cronbach alpha reliability through questionnaire

Cronbach's alpha	Number of questions	Components
673/0	4	The traffic
797/0	3	Trips within the city
712/0	2	Energy consumption
905/0	9	Total

Statistical tests, statistical test level measurement variables to investigate the relationship between them has been paid, on the grounds because the MCS level, a rating is applied tests are testing of Chi-square the correlation coefficients person that briefly explanations about these tests:

Chi-square test:

The basis of this test observed in the study of research projects that have gathered in the abundance are expected. I. e. We want to know whether oba

served between the abundance of an expected a meaningful difference exists or the. The difference and the result is a chance. In fact, we want to know that there is a connection between the two variables or two independent variable distribution X2 usually when that data collected as many and hypotheses and differences in the relationship. From the data collected in a table, which includes r row and column that such an agreement on a table. nij values of the observed in each cell that the inter section of the ith row Weston j.

and non-artificial humanity has always been on the agenda of the international and regional organizations.

Significant research and research funding from the per capita quota of the GDP of industrial and developing countries, this is a point that must be before the society with the problems and unpredictable future strategy, the appropriate mechanism before and the mechanisms. Choose optimal solution and the mechanisms should be complying with the scientific developments in the evening to the development and the horizon also plotted according to the realities of the future, the visitor. Of course, it cannot be said that in order to solve the complex tasks cities merely rely on communications and information technology is enough, but constitutes one of the possible solutions that many of its capabilities facing planners and designers, urban and in parts of the architecture is important. Here on topics that a new era of technologies in our hands to cities in the future, better, healthier, more beautiful, safer and more performance. The Urban rapid growth factor of many issues and urban problems such as unemployment rate increase, inaccurate and inefficient use of resources, expand poverty, lack of the civil service, the housing problem, such as environmental pollution and in these countries have been growing. The evidence shows that the growth of unbridled cities as well as the cause of many efforts and try to resolve the problems of the urban planners in these countries.

The above discussion shows that the role of information and communications technology in transportation system appears to reduce child mortality is effective. Gives literature to reduce losses estimated at 30 and 40 %, 60 %, and even by certain types of Advanced drivers in certain parts of the road networks. At the same time, many recent research has found a relatively high potential of smart cars ' communicate with road infrastructure and other vehicles to regulate driving behavior in the optimization of fuel consumption, for example, about 30 percent reduction. In general, three restrictions for the approval of the applications of information technology and communications in the new urban transportation system, for Example, (1) high costs for users in comparison to the perceived benefits, With users costs increase if more than one layer is involved in the system, including fixed ins

rastructure, (2) - of - the - art technology and actor complexity, Similarly, if it takes more than one layer is involved, and (3) legal issues enough not settlement, for example, in the case of responsibility and responsibility of the actors involved in the case of failure of the new software (for example, the drivers, producers and operators of communications and information technology systems). Considering these factors, it seems that the leading automated systems, or an electronic or stable, the smallest potential in the short and medium term.

In fact, in the present study instances of modern technology applications taking control traffic and reduce consumption and unleash the investigation. That this technology can be associated with management can to reduce environmental effects on the natural environment, as well as a better use of citizens for the municipal services to improve the quality of life and sustainable development. That all need to invest in the cities and urban management. Sustainable development cities have several dimensions and development of a one - dimensional development. But the economy, ecology and social cohesion and basic pillars of it is essential that these three components of with each other in the balance. To create such cities to identify factors or necessity of the barriers, which is one of the factors affecting citizens living in urban areas, transportation and traffic, as every citizen is obliged to urban transportation system and use of incorrect, manager of the system and the problems caused by traffic congestion in the city is affected. So, without regard to the question of basic system urban transportation and cannot be the problem of traffic management urban transportation.

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