Research Article

An Overview of Urban Transport in Sana’a (Yemen)

1Aows N. Altef, 2Mojtaba Zourbakhsh, 1Foad Shokri, 1Mohammad Hesam Hafezi, 1Amiruddin Ismail and 1Riza Atiq O.K. Rahmat

1Sustainable Urban Transportation Research Centre (Sutra), Department of Civil and Structural Engineering, Faculty of Engineering and Build Environment, University Kebangsaan Malaysia, 43600 UKM Bangi, Selangor Dural Ehsan, Malaysia
2Department of Civil Engineering, Islamic Azad University, Estahban Branch, Estahban, Iran

Abstract: Due to enhance of number of motor vehicles, the amount of consuming of the world’s oil supply is increased and it is the major source of pollution to the surroundings. Base on this, it is vital to use different techniques to provide more opportunities to identify strategies that can help to utilize more efficient from the current transport resources. In Yemen, the rapid increase in the use of the private vehicles has resulted in increased traffic congestion, accidents, inadequate parking space and air pollution, among other problems. Base on these problems, this study attempts to focus on some factors which lead to rise in private vehicle ownership, motorcycle related concern, demand of more public transport, traffic congestion, parking, road safety and air pollution. Hence, this study tries to rectify the major concerns of traffic congestion and other environment hazards. When the mentioned elements are addressed efficiently, the effective contribution can make successful urban development.

Keywords: Mode choice, public participation, sustainable transport, transportation planning, travel time

INTRODUCTION

Nowadays, increased urbanization was due to the population that was increased by the number of urban and suburban trips (Shokri et al., 2012a; Ismail and Hafezi, 2011a). Hence delay time as a part of traveling period has a significant impact on travel time calculation (Shokri et al., 2010; Altef et al., 2013; Hafezi and Ismail, 2012b). Traffic congestions lose billions hours and money. In order to reduce these losses, it is required to create an efficient method to resolve traffic congestion and reduce the delay time (Hashimoto, 1990; Hafezi et al., 2012a). Vehicle fuel consumption increases approximately 30% under heavily congestion (Hafezi et al., 2012c; Ismail et al., 2012a). Jennifer and Oliver (1996) found that the availability of the pre-trip information to the driver enhances drivers' self-belief to use the best route and allow commuters to make better-informed transit choices Travelers information and guidance saves travel time and helps a traveler to avoid congestion on the other hand it can improve traffic network performance and it’s more efficient than paper maps or written instruction (Ismail et al., 2012b, c, e). There is now a strong need to make our route travel as efficient as possible (Shokri et al., 2009a; Ismail et al., 2012f, 2013). Several studies have been carried out examining roadway congestion in term of lost productivity and waste fuel (Shokri et al., 2012b; Ismail et al., 2012d); e.g., in 2003 it has been estimated that 8.7 billion liters of fuel were wasted due to congestion in the USA (Schrank and Lomax, 2005; Hafezi and Ismail, 2011b). Transport system provides many benefits, but it also causes many problems (Shokri et al., 2009b, Hafezi et al., 2012a). It serves non-drivers poorly, distributes benefits and costs inequitably; financially burdensome to households, governments and businesses, increasingly inefficient due to traffic congestion and dispersed land use, a major cause of death and disability, contradicts environmental and quality of life objectives and relies on non-renewable resources that may become scarce in the future (Litman, 2003; Hafezi and Ismail, 2011c). This study attempts to identify the major concerns of traffic congestion and other environment hazards in the study area (Hafezi and Ismail, 2011d). When the mentioned elements are addressed efficiently, the effective contribution can make successful in urban development.

STUDY AREA AND URBAN POPULATION

In Sana’a (Fig. 1) capital city of Yemen the number of moving vehicles 300000 per day, register own car and taxi increased from 4812 in 2001 to 16834
in 2010. Consequently but after 2008 the government of Yemen tried controlling to register of taxes therefore the numbers of taxes decrease (TMOCCS, 2009). The number of populations (Table 1) Sana'a are 1747627 in 2009 and area of Sana'a 1604 km² making it Yemen's largest city (TMOCCSR, 2010).

Table 1: The population of Sana’a

<table>
<thead>
<tr>
<th>Year</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>1911</td>
<td>20000</td>
</tr>
<tr>
<td>1921</td>
<td>23000</td>
</tr>
<tr>
<td>1931</td>
<td>25000</td>
</tr>
<tr>
<td>1940</td>
<td>80000</td>
</tr>
<tr>
<td>1963</td>
<td>100000</td>
</tr>
<tr>
<td>1965</td>
<td>110000</td>
</tr>
</tbody>
</table>

Yemen is a developing country which suffers the consequences of explosions in both human and motorization. This has been accompanied by a heavy toll of deaths and economic cost. There is currently little public transportation (buses) and no rail or metro network but one will also be built. The public transport system in Yemen is very poor and hence, the private transport increase was observed in private transport. Generally, non-motorized transport means to walk or use bicycles, (Ryley, 2006).

**TRANSPORT SYSTEM**

In Yemen, the car, due to its inexpensive cost, has been a popular mode of transport in it. Consequently, casualties among car users constitute a high portion of total fatalities in these countries. The people are less non-motorized transport users, motorcycles increased in Yemen, it use large of motorcycles in the cities. Motorcycle users are more vulnerable to fatalities and injuries (Beck et al., 2007; Hafezi and Ismail, 2011a). The motorcycles are allowed in highways; safety measures like compulsory wearing of helmet and exclusive motorcycle lane are not prevalent in Yemen. More than half of total traffic fatalities are death related to motorcycle accidents (Kulanthayan et al., 2000).

Motorcycle is popular in Yemen and use it as a taxi especially at peak time of congestions, the number of motorcycle registers at 2008 are 10769 and the numbers of motorcycles not register more than this number (Central Statistical Organisation (CSO), 2011). The increasing numbers of motor vehicles in Yemen, all kinds from own cars, private transport, taxis, motorcycles, trucks and heavy equipments as indication of the severity of congestion on major roads between main and interior cities. Almselati et al. (2011) Table 2 refers to the number of private car, taxi and other vehicles in 2007 and 2008 in Yemen.

Table 2: The numbers of car in Yemen in 2007 and 2008

<table>
<thead>
<tr>
<th>Year</th>
<th>Private car</th>
<th>Taxi</th>
<th>Other vehicles</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>273,867</td>
<td>97,766</td>
<td></td>
<td>624,154</td>
</tr>
<tr>
<td>2008</td>
<td>302,892</td>
<td>107,915</td>
<td></td>
<td>670,337</td>
</tr>
</tbody>
</table>

(Yemen is one of the most affected countries of the traffic accidents, the number of fatalities due to
Table 4: Presented the cost of road traffic accident for main cities in Yemen on 2010

<table>
<thead>
<tr>
<th>City</th>
<th>Accident</th>
<th>Fatalities</th>
<th>Seriously injured</th>
<th>Minor injury</th>
<th>Loses RY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sana’a</td>
<td>4889</td>
<td>478</td>
<td>2453</td>
<td>2466</td>
<td>1052930000</td>
</tr>
<tr>
<td>Aden</td>
<td>1053</td>
<td>90</td>
<td>532</td>
<td>341</td>
<td>235095000</td>
</tr>
<tr>
<td>Taiz</td>
<td>1897</td>
<td>377</td>
<td>1046</td>
<td>1361</td>
<td>645370000</td>
</tr>
<tr>
<td>Hadramoot</td>
<td>321</td>
<td>53</td>
<td>151</td>
<td>304</td>
<td>802490000</td>
</tr>
<tr>
<td>Alhodeidah</td>
<td>1262</td>
<td>484</td>
<td>1383</td>
<td>596</td>
<td>442680000</td>
</tr>
</tbody>
</table>

(Central Statistical Organisation (CSO), 2011)


Accidents of cars between deaths and injuries in 2009 are 22034 (WHO, 2009), the social and economic impacts of traffic accidents are very large annual losses of money in addition to the losses and the high proportion of social orphans and the disabled. Table 4 presented the number of accident, fatalities, serious and minor injuries and cost for main cities in Yemen such as Sana’a, Aden.

Table 5 presented the cost of Road Traffic Accident from 2001 to 2010 in Sana’a city. Road traffic risk may be defined as the probability of accident, injury, death and damages for a given amount of activity or exposure. Accident There is reason to believe that the risk increase for young car drivers is connected to the increased risk at night or weekend days. Accidents by young drivers are typically single accidents especially at night during weekends (Ismail and Elmloshi, 2011b). Road accidents were the main reasons cause of all deaths in Yemen as example Sana’a city the death, injuries and road accident as below in Table 5 (TMOCCSR, 2010).

Base on the mentioned literature, the rapid increasing car users in Yemen and especially in Sana’a has resulted in congestion, accidents and casualties has prompted to undertake various studies to address this problem one of these studies was the shift of transportation mode from private car to public transportation in Yemen. This study made an attempt to determine whether car users switch to public transportation mode if the Public Transportation (PT) is improved by decrease the travel time cost of PT and analysis the elements which are interfere to the travellers’ decision for mode choice such as travel time, cost, convenient, safety and traveller habits.

**CONCLUSION**

This study attempts to select and review the potential factors that have a high impact on travel mode shift from car to public transportation mode. To motivate the traveler to switch to the public transport mode, the potential factors that discourage car use and incentives for using public transport will be identified. By identifying and understanding the factors likely to encourage the shift, a model for mode selection can be developed. Furthermore, the likely proportions of car/public transport use were estimated after hypothetical improvements in public transport. Data will be collected from a survey in selected areas of SANA’A (City Center and main sides of the city), because the crowd of those selected areas seem to come from all over SANA’A and districted area of that. The independent (explanatory) variables to be included in the models are demographic details, socioeconomic characteristics of individuals, trip characteristics and mode attributes.

**REFERENCES**


