

Strategy Plan and Policy Model of Public Transport in Saudi Arabia

Jamal Eid Abdulaal¹, Bader Alanazi², Herika Muhamad Taki^{3,*}

^{1,2} King Abdulaziz University, Department of Urban and Regional Planning, Jeddah, Saudi Arabia.

³ Universitas Trisakti, Department of Urban and Regional Planning, Jakarta, Indonesia.

* Corresponding author's email: herika@trisakti.ac.id

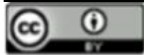
Received: October 17, 2022

Accepted: February 13, 2023

Published: February 13, 2023

Copyright © 2023 by author(s) and
Scientific Research Publishing Inc.

Open Access



Abstract

GDP of Saudi Arabia has increased from \$ 1 billion US dollar in 1972 to more than \$300 billion US dollar in 2011. The increase in population from 10 million in 1950 to 28 million in 2010, urbanization represent about 80%. the country consume about 20-25% of it's own oil production about 2.5 million per/daily. This shows that the Saudi policy have given incentive to cars user for long-time and has done little to manage demand or support public transport. The main objective of this paper is place the Saudi model in public transport in the international context and to draw an international prospective of public transport policy and the rational of government intervention in transport sector. The study gives classification models which characterize the industries and form of intervention. Furthermore the study highlight some of the approaches which adopted by both developed and developing industry at specific time. The Methods and models use vary from one country and this study had classified intervention in transport sector in five models which are such as models of ownership, regulation, competition, finance system and private public partnership model. In 2011 Saudi Arabia has introduce it First National Transport Strategy, which have adopted many objectives among the most is, to improve efficiency of transport sector, module environmental impact of transport sector, improves safety facilitate the movement of peoples and goods to improve economic activity (MOT 2011). This state shows that no clear objectives to improve public transport policy.

Keywords: Strategy Plan, Policy Model, Public Transport, Saudi Arabia

1. INTRODUCTION

Saudi Arabia has experience rapid changes during the last five decade, such as major economic development, rapid growth in population and urbanization and high rate of car ownership. Saudi Arabic and the Gulf State are different in some respects from developed and developing countries as they have their own social, political and economic characteristics. This part of the world become one of the most attractive area for emigration from developed and developing countries about 8 million in 2011, who were attracted by Financier development program infrastructure construction program. GDP of Saudi Arabia has increased from \$ 1 billion US dollar in 1972 to more than \$300 billion US dollar in 2011. The increase in population from 10 million in 1950 to 28 million in 2010, urbanization represent about 80%. Increase income are seen as the main source of transport problems because it means the country experienced high rate of car ownership for example in 1971 the number of registered vehicles was only 0.144 million jumped 4.4 million in 1987, 8 million in 2000, and 13,438 million in 2011 Ashariqa (2008) where annual registered

new cars is about increased from 323,302 vehicles in 2001 to 735967, vehicle in 2008 and 702,283 vehicle in 2010. Statistical Year Book (2010). Also the Saudi cities have experienced an increase in trips rate per person from 2.012 trip/person/day in 1980 to 2.257 trip/person/day in 2011 especially in Jeddah and where average of daily passenger trip is estimated 8 million trip/daily at annual growth rate of about 3% per annum, where the model split of private cars to public transport 7% to 93% respectively. Road construction is regarded as continue procedure where the annual rate of road and highway expansion at 2.7% in 2008, expending in road program about is estimated 5 billion US dollar in 2008. Traffic volume has increased by 29% between 1988 and 2008. As result the country began to suffer serious air pollution and traffic problems mainly congestion and road accidents (Abdulaal, 2004).

Road accidents in Saudi Arabia is regarded as serious problem even so the government have adopted different safety programs during the last decade but the number of injured and killed is experience great growth for example the number of

killed person in 1971 was 570 person has been jumped by 5168 in 2004 and 6458 in 2008 and 7500 in 2011, where number injured has increased from 23723 in 1971 to 65,000 in 2010 and this due to the failer of safety program even so, the country did not develop a national strategy to solve, the problem at national scale. In 2011 the country has introduce more traffic measures and speed control programs, which improve the situation and the experiment is under evaluation.

In addition to that Saudi Arabia has adopted low fuel price policy as welfare policy and that is estimated to cost the government about \$ 10 – 20 billion US Dollars annually, for example the cost of one litter of gas lien is about \$ 0.10 US dollars. This led to over consumption and encourage the use of private car. This make the country consume about 20-25% of it's own oil production about 2.5 million per/daily. In the other hand no any form of subsidy to public transport that make the country one of the highest in carbon emotion producer in the world, creating environmental and health problems.

In addition few efforts has been made to manage balance the model split and demand, where in many developed countries has introduce different meagers to manage traffic demand, such as private car parking, physical constrains, road pricing and petrol tax and gives priority for certain road users. Use of intelligent transport system and use traffic management approach to increase the efficiency and capacity of existing road infrastructure. This shows that the Saudi policy have given incentive to cars user for longtime and has done little to manage demand or support public transport.

2. Methods

2.1 Objectives the Study

Saudi Arabia is regarded as one of the major oil producer, and that make it a big player in energy industry and one of the 20 major economic countries in the world. Saudi Arabia has experience many economic urban, social and political changes. The country have adopted different transport policy to facilitate economic development among the most wide expansion road and highway programs, few resource has been devoted to public transport. This policy had failed to support transport industry.

The main objective of this paper is place the Saudi model in public transport in the international context and to draw an international prospective of public transport policy and the rational of government intervention in transport sector. The study gives classification models which characterize the industries and form of intervention. Further more the study highlight some of the approaches which adopted by both developed and developing industry at specific time.

3. Result and Discussion

3.1 Models of Intervention

The objectives of public transport and methods of intervention may vary from one country to

another due to different political situation among countries. As a result, transport provision and operation differ between countries in both principle and in detail, even so, fundamental changes may take place within one specific country at specific time.

In general, there are different policy model which could be used to identify and classify the public transport system among different countries. This study had classified intervention in transport sector in five models which are such as models of ownership, regulation, competition, finance system and private public partnership model.

In general, most of the developed countries such a UK, USA, Australia have adopted the regulatory model to control the public transport system even for specific time and that to maintain adequate degree of coordination.

In service provision, allowing stability in fare and level of service, protecting operator from waste-full cooption and maintaining a degree of cross subsidy to ensure the provision of comprehensive service among the country. But in the 1980s some of these countries like the UK have adopted the deregulated model by promoting competition as a means to reduce government subsidy and increase efficiency.

The situation in the developing countries is complex but one of the common characteristics is the coexistence of both public and private transport system by adoption of a multiple form of ownership which mainly fails to meet the excessive element for public transport due to limitation in resources.

3.2 Ownership Models

Models of ownership take different forms of private or public ownership, or a combination of both type of enterprises such as sole proprietors, cooperatives, private limited companies, public cooperation municipalities public limited companies or state department. Some government regarded public transport system as public utility which must be put under state ownership while other regarded it as commercial services which should be left the market forces, Flauks, (1987).

3.3 Regulation Models

Regulation is seen as alternative means to redirect ownership or usually it takes place when the state feel itself unable to achieves its objectives while the market is free. Gillinwater (1986) and Barch and Button 1990 noted that transport sector is one of most regulated sectors in any economy and it regarded as essential feature of public policy to control Quality and Quantity of services.

3.4 Competition Models

Regulation models have required massive subsidies but attitude towards wide financial support was not accepted by politicians or economists

because it reduces the efficiency and miss-used public money. This has led to a new approaches and changes in economic policy, so Deregulation has been seen as the solution to increasing efficiency and effectiveness in the provision of public transport system by encouraging competition and reducing the influences of the role of the state in regulating the industry by removal of all government controls over the behaviour of Firms to encourage competition (Bodgson and Tophom, 1988).

3.5 Finance Models

The finance and fiscal system is regarded one arae of government intervenes in public transport and it is take a direct or indirect form such as Taxation policy, subsidy policy and access to capital. Subsidy could be used to permit a lower fare policy and allow the services to be expanded. Subsidy usually take two forms capital (as terminals and infrastructure) and operational subsidy is provided to cover loss- making services, concessionary and vehicles replacement program Faulks (1990).

3.6 Public Private Partnership Model (PPPs)

Finance is regarded as the most difficult part in transport service provision. So many countries have introduced the PPPs as means to provide service or project. This model assumes to reduce substantial financial, technical's operational risks and revenues in the projects and it was successful in designing, building and operating transport and infrastructure project. Australia has developed major experience to deliver billions of dollars of critical transportation projects by using public private partnerships approach, by inherent different public private partnerships approach to distribute the risk between public private partnerships (cZorwinski and Geddes, 2010, Bader et all 2022).

Variation in ownership is usually associated with performance differences where government owned companies are characterized by lack of any incentive to provide the appropriate quality of services, resources are limited innovation, there is a lack of market disciplines by restriction on capital and investment. In addition, they are protected from competition and experience, some form of intervention from government not only in level of service and force policy but also in management structure and employment policy which affect productivity and efficiency. (Dodgson and Topham 1988, Gonnopoulos 1989, and Richards and Wilson 1991).

Hensher (1987, 1988b) mention intervention in public transport to improve social effectiveness issues which reflect the preference for allocative efficiency, and equity and "doing the right things", where in contrast productive efficiency is "doing things right" by getting high performance and high productivity. In general economists make a distinction between two types of efficiency, the first is called allocative efficiency which leads to the use of

resource or resources allocation and the second type is called managerial or x-efficiency which implies that production is maximized for a given output (Pagano, 1984).

Hibbs 2003 discuss the situation of public transport in different European countries where he concluded that bus services for example in Copenhagen all tendered on gross contracts, Sweden are largely tendered, Norway is moving to tenders with move to self-public undertaking to private enterprise, neither land is moving to regional responsibility, but privatization is not popular.

France was traditionally used area monopolies at same time given more freedom to it concessioners but since 1982 they intend to encourage more competition between operators.

Germany is legally based on the principle at free inter-partnership and market initiative and enlarge hardly exist, mostly publicly owned. The situation in Germany is complex contracts offered to private firms but the financial aspect may not be sustainable. France major changes in 2000 could observed influence of state sector experts and private sector takeover. In general, is committed to tendering, which create more risk for operators, it is compared with gross tendering. Hibbs 2003 conclude that Europe has adopted various approaches for the renewal of tender contract which cause some forms of problems.

3.7 Model Adopted by Developing Countries

In general, public transport policy objectives in the developing countries are seen as more difficult and more complex than in developed nations due to the existence political instabilities and low economic performance. All of which make it difficult to defend clear public transport objectives and to allocate resources to achieve these objectives (Taki 2018).

Lack of experience, objectives and funds among developing countries have forced some developing countries to adopt different models to achieve their unclear and vague objectives of public transport policy, one of the common characteristics of public transport in developing countries is the co-existence of both public and private transport system, because either the public sector or private fails to meet the excessive demand for public transport due to limitation in service provision and financial resources which are allocated to this sector.

In general, such co-existence is widespread in many countries of African, Southeast Asian and Middle-east. In the middle-east such a multiple form of ownership is widely experienced among countries such as Egypt, Jordan and Iraq.

3.8 Public Transport in Gulf State

In general, public transport in Gulf countries are seen as social services mainly used by expatriate. Asian and workers from neighbouring Arab countries and it is represented a small market share of travel demand (5% - 10%) due to the domination of the private mode. Multiple ownership model of public transport is experienced in some Gulf State such as Kuwait, Bahrain and Saudi Arabia. For example, Kuwait public transport was introduced in 1962 through a joint venture between the government and private sector. In 1979 the Kuwait transport company was nationalized, and it became a state-owned enterprise Abdulaal (1992).

Traditionally Gulf State has ignored investment in public transport where few resources have been allocated to this sector and the society become automobile culture and that makes it difficult to be competed unless strict measures and traffic restrain program are introduced and enforced but before that these states need to develop an efficient public transport system which can attract car user.

Recently great movement has taken place in United Arab Emirate, where local transport department has adopted new approach as in the case of Dubai, and Abd-Dubai, where the former completed new metro service in 2009 when Abu-Dubai begins works on metro and light rail design in 2012.

3.9 Dubai Transport Model

Dubai is located in United Arab Emirate which is regarded as member of Gulf States Council, it shares many common political, economic and social characteristics physical size and population while the Jeddah city experience rapid growth at same time adopted comprehensive transport policy to overcome, it is transport problems. Dubai has adopted interesting, regulated transport model where the state has intervened in public transport industry in different forms which make it as a good case to study in comparison to Saudi Model.



Fig 1. Dubai Road and Transport Authority (RTA) Dubai Road and Transport Authority (RTA) is owned coordinate, organize and operate all form of public transport, it has established strategic plan in 2007-2009 and guiding principle among most is:

- Introduce integrated land use and transportation plan,

- Optimal integrated and balance transportation system,
- World-class transportation service and safety levels.

The RTA aim is to ensure a comprehensive public transport system which meets city needs, which includes Rail, Bus, Taxi and Farry services. More attention is given to Metro project. Different objective has been set-up among most important is to increase the mode share of public transport service to 26% BY 2010 instead of 7% current situation (Kaiser, 2008, Taki , 2017).

3.10 Transport Planning and the Development of Highway Programs

Saudi Arabia has developed a five-year development plan since 1970. This plan regarded transportation and communication as crucial aspects of development which should be planned to satisfy fundamental needs of all economic, industrial agricultural and mining sectors. As a result, the government allocates large financial resources which represent 10-15% of national expenditure. This policy was seen as necessary to construct and complete major road highway construction projects. In general, there has been no a shepte in emphasis in the development plans either to construction our maintenance program (MOP 2010), where a few effort has done to give more support to the public transport sector.

The increase in oil prices in the international market in seventies, nineties which continued until nowadays. This has reflected great growth in GNP and that affect government expenditure, planned to facilitate urban development program especially road program, which have many objectives among the most, to construct old road network, develop major highway program, to construct the rural and agricultural road, to maintain existing transport facilities.



Fig 2. Highway Programs Dubai

This policy adoption, result that most of urban area in Saudi Arabia have been made to design urban areas, to accommodate the need of cars users in a totally unrestrained way which to led major conjunction especially during peaks time.

3.11 Public Transport Model in Saudi Arabia

Public transport industry is regarded a new phenomenon at the same time, the industry has gone through major changes during the last four decades. Traditionally public transport service is provided by private operator through partransit operation until 1979 with very limited form of control, either quantity or quality. So, it could be described as deregulated market, privately owned and operated or with no any form of financial assistance. Partransit service in Saudi public is regarded as an unorganized service, operators do not have any form of coordination of operating strategy, market plan or schedules it depends on operators' decision and ability to work operators do change the route from time to time and there is no form of restriction regarding quality and quantity with exception of fair control, no safety measures or operating conditions Abdulaal, (1992).

The government introduced in 1979 the first scheduled public transport service under the management, and operation of the Saudi Arabian Public Transport Company (SAPTCO). SAPTCO is considered to be a publicly/privately owned company, which provides its services under supervision of Ministry of Transport where the government covers the loss of the operation. This means that Saudi Arabia has adopted the PPPs model to establish the bus company and that reduce any risk for operation and that to operate to provide public transport service for all social groups, maintain major network, reduce public expenditure on road programs and to provide more efficient and civilized public transport services.

The adoption of this model has increased the number of passengers from 80 million in 1980 to 143 million in 1983 and that due to increase in level of service, the existence of low fare policy, the reliability of the services. This program encouraged SAPTCO to invest more in facilities, infrastructure, buses and machines to maintain its standards, all of which required a lot of capital and that requires much more government subsidy.

In the middle and late 1980, oil price has been fallen dramatically which causes major reduction in government revenue. Also Gulf War and high operating cost of SAPTCO has affected the performance of the company which led to major reduction in level of service. This has affected both SAPTCO passenger and revenue. In addition to that the company has major competition from par-transit operators and taxi service where both services have been deregulated and number of operators have been increased dramatically. For example, the number par-transit operator increased from 500 operators in 1979 to more than 2500 operators in Jeddah in 2005, whose transport about 80 million passengers annually. Also Taxi service operators rose from 30 operators to 300 operators who transport about 100 million passengers yearly in Jeddah (Abdulaal, 2005). Also attitude toward public

transport is very low due to the low fare Taxi Policy, In addition to competition from private cars.

Table 1. Service Transportation

Service	1979	2005
Operator Par-Transit	500 Operators	2500 Operators
Operator Taxi Service	30 Operators	300 Operators

Source: Abdulaal

Table 1 shows about data increase operator in a few years. This led to the reduction in public transport demand by 97% 5.5 million passengers in 2011 is seen as major failure of public transport policy in Saudi Arabia, which required state intervention and dramatic policy changes.

In 1979 the Saudi Arabia Government introduced its first scheduled bus service through SAPTCO to replace the traditional par-transit services. SAPTCO is a Franchise company, ownership is distributed between government with 35%, Saudi investors with 25% and the rest as shares with general public. It shows the government use PPPs as new approach to provide more efficient services.

Intervention in public transport market was seen as necessary because the private sector failed (Market failure) to provide an efficient public transport, when the partransit was seen as lacking organization did not provide major network. This encourages the private cars to provide individual mobility under the high cost, social cost such as congestion, pollution and high road accident. According to Al-Qadhi [4], the sharp decrease in ridership on the buses of SAPTCO (30% in just one year) was partly because of the doubling of the fare in 1983. The other important reason for the big drop in the number of passengers of SAPTCO after the peak year 1982 was the sharp exodus of workers during the mid-1980's.

Table 2. Public transport daily ridership in May 1992.

Period	SAPTCO	Small Coaches	Total no. of passengers
Weekdays	15.800 /day	74.300 /day	90.100/ day
Weekend	16.700 /day	94.600 /day	111.300 /day

Source: Al-Qadhi

Table 2 shows a major difference between the number of passengers carried by SAPTCO and the number carried by small coaches.

3.12 Models in Saudi Arabia

It seems subsidizing public transport is seen as in nature in respect. Investment returns and unseen where investment in road-construction is more feasible and tangible. Even so, the state did not develop the appropriate institutions, which can

develop implement policy, control operators and allocate financial resources to subsidies services. they may be two weeks for the tasks which they have to perform because they do not have requisite skills to perform the function adequately.

Local base in the metropolitan area in Spain is a mixed system in which one public and several private firms supply the service in different areas. In Barcelona where metropolitan deal transport is regulating concessions where a group of private concessionaires operate 90 routes. 55% of service operated by TMB and 45% by AMB.

3.13 Future Challenges

In 2011 Saudi Arabia has introduce it First National Transport Strategy, which have adopted many objectives among the most is, to improve efficiency of transport sector, module environmental impact of transport sector, improves safety facilitate the movement of peoples and goods to improve economic activity (MOT 2011). This state shows that no clear objectives to improve public transport policy.

Actually, Saudi Arabia transport sector got many challenges, which should have in the future in terms of different aspect, developing strategies for mass transportation over a short period of time, crating economic benefits on exists road infrastructure and integrating maintain and safety into planning, designing and operating road program.

In general May Saudi cities start to think in introducing mass transit network or metro service as in Rihyadh, Jeddah, Makkah and Madina. Especially offer the success of Metro Service in Dubai, United Arab Emirate, which has built reliable and integrated metro and bus service. Dubai metro is a fully automated metro network, while multiple lines are planned. This service is currently subsidies by government. This service is launched in September 2009, the system transport about 69 million passengers in 2011, where about 346.6 million passengers use the public transport in 2011 in Dubai, where a total of 107.4 million passenger use buses, and 62.3 million use metro and 155.9 million use Taxi and 14 million used marine transit modes. This has been taken place due to the huge investment injected by the Dubai government for the development of infrastructure of transport sector have proved both successful and effective, Arabian supply (Haln, 2012).

4. Conclusion

In 1979 the Saudi Arabia Government introduce its first scheduled bus service through SAPTCO to replace the traditional par-transit services. Intervention in public transport market was seen as necessary because the private sector failed (Market faller) to provide an efficient public transport, when the partransit was seen as lacking organization did not provide major network. This encourages the private cars to provide individual mobility under the high cost, social cost such as congestion, pollution

and high road accident. It seems subsidings public transport is seen as in nature in respect. Even so, the state did not develop the appropriate institutions, which can develop implement policy, control operators and allocate financial resources to subsidies services. Local base in the metropolitan area in Spain is a mixed system in which one public and several private firms supply the service in different areas. In 2011 Saudi Arabia has introduce it First National Transport Strategy, which have adopted many objectives among the most is, to improve efficiency of transport sector, module environmental impact of transport sector, improves safety facilitate the movement of peoples and goods to improve economic activity. This state shows that no clear objectives to improve public transport policy. This service is currently subsidies by government. This service is launched in September, 2009, the system transport about 69 million passengers in 2011, where about 346.6 million passengers use the public transport in 2011 in Dubai, where a total of 107.4 million passenger use buses, and 62.3 million use metro and 155.9 million use Taxi and 14 million used marine transit modes.

Acknowledgements

The authors are grateful to the student, lecturer, education staff, and all participant involved in this research in the field.

Reference

- Anand, N., van Duin, R., & Tavasszy, L. (2014). Ontology-based multi-agent system for urban freight transportation. *International Journal of Urban Sciences*, 18(2), 133-153.
- Anderson, S./Allen, J./Browne, M. (2005). Urban logistics-how can it meet policy makers' sustainability objectives? In: *Journal of Transport Geography* 13(2005), pp.71-81.
- Al-Qadhi, Saad (1992) Evaluation of the public transport local performance in Al-Riyadh, Saudi Arabia, King Saud University, College of Engineering, Research Centre
- Bader Alanazi., Jamal Eid Abdulaal., & Taki. H. M., (2021). Application of Sustainable City Logistics in Saudi Arabia. *Journal of Applied Geospatial Information (JAGI)*, 5(2), 526-531.
- Crainic, T. G. (2008). City logistics. In *State-of-the-art decision-making tools in the information-intensive age* (pp. 181-212). INFORMS.
- H.Ch. Pohl, *Systemy logistyczne*, Biblioteka Logistyka, Poznan, 1998, p 11.
- Jonsson, P., & Mattsson, S-A. (2005). *Logistik LÄran om effektiva materialflöden*. Studentlitteratur AB.
- Kingdom of Saudi Arabia. (2020). *Transport and Logistic*.
- Ma, Y. (2014). *City logistics in China—an empirical study from an emerging-market-economy*

- country.
- Ministry of Transport and Logistic Services KSA. (2020). The Kingdom of Saudi Arabia: An exceptional location with unique advantages for international trade and logistics.
- Rosita, M., Pujawan, I. N., & Arvitrida, N. I. (2010). Simulasi Sistem Logistik Perkotaan Untuk Memenuhi Pasokan Barang ke Retail Modern di Surabaya dengan Penambahan Pusat Distribusi.
- Russo, F., & Comi, A. (2012). City characteristics and urban goods movements: A way to environmental transportation system in a sustainable city. *Procedia-Social and Behavioral Sciences*, 39, 61-73.
- Szymonic, (2012). *Logistics and Supply Chain Management*.
- Taki, H. M., & Maatouk, M. M. H. (2018). Spatial statistical analysis for potential transit oriented development (TOD) in Jakarta Metropolitan Region. *Journal of Geoscience, Engineering, Environment, and Technology*, 3(1), 47-56.
- Taki, H. M., Maatouk, M. M. H., & Lubis, M. Z. (2018, October). Spatial model of tod in jmr's master plan. In 2018 International Conference on Applied Engineering (ICAE) (pp. 1-6). IEEE.
- Taki, H. M., & Maatouk, M. M. H. (2018). Promoting transit oriented development typology in the transportation planning. *Communications in Science and Technology*, 3(2), 64-70.
- Taki, H. M., Maatouk, M. M. H., Qurnfulah, E. M., & Aljoufie, M. O. (2017). Planning TOD with land use and transport integration: a review. *Journal of Geoscience, Engineering, Environment, and Technology*, 2(1), 84-94.
- Taki, H. M., Maatouk, M. M. H., Qurnfulah, E. M., & Antoni, S. (2017, November). Land suitability assessment for the potential location of transit oriented development (TOD). In *International Conference on Smart Cities, Infrastructure, Technologies and Applications* (pp. 357-359). Springer, Cham.
- Taniguchi, E. (2014). Concepts of city logistics for sustainable and liveable cities. *Procedia-social and behavioral sciences*, 151, 310-317.
- Vanni, R., Jaimes, L. M. S., Mapp, G., & Moreira, E. (2016). Ontology driven reputation model for vanet. In *AICT 2016, The Twelfth Advanced International Conference on Telecommunications, IARIA* (pp. 14-19).