A Study on Strategies of Air Pollution Control and Reduction in Urban Areas

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Abstract
There are various air pollution control technologies and strategies to reduce air pollution such as reduction of the vehicle producing air pollution, increasing public transportation, promoting reduction in travels demand, encourage to active transport, environmentally friendly fuels, scrap old cars, vehicle inspection and maintenance program, vehicle emission control technologies and etc. In the present study the efficacy and application of various strategies for traffic pollution control was reviewed. The strategies and techniques are categorized into four group viz. alternative fuel, passive control, traffic management and vehicles emission control. The present study revealed that utilization of alternative fuels, increasing public transportation, proper design of the city for air pollution control, increasing green space, scrapping old vehicles, speed limitation, location of parking and the inspection and maintenance program are useful for control and reduction traffic pollution in urban areas.

Keywords: Air pollution, Alternative fuel, Passive control, Traffic management, Vehicle emission control.

1. INTRODUCTION

Sustainable development requires the collective consideration of economic development, environmental protection and social justice when formulating development strategies and policies [1]. One of the main factors of any sustainable development is urban air quality. Urban air pollution cause many negative impact on desirable environment condition and human health and creation many cost subsequently. Major impacts of air pollution on environment are climate change, global warming and acid rains. From a general view, the costs of air pollution in consequence of transportation can be categorizes to economic, social and environmental costs. For example, study in china shows that the cost of health damage of air pollution was about 20 billion dollars a year. According to the National Resources Defense Council, some 64,000 people in the USA may be dying prematurely each year from cardiopulmonary causes linked to air pollution. Several study on human effects of air pollutants have been carried out, negative impact on physiological performance and subclinical symptoms (heart rate variability, peak expiratory flow rate, etc.)and obvious diseases (asthma, chronic obstructive pulmonary disease, stroke, lung cancer, leukemia, etc.), premature births and deaths [16,17]. In 2008, the World Health Organization (WHO) estimated that air pollution annually leads to the premature death of around two million people worldwide[15].

Anthropogenic air pollution sources can be categorized to two source, stationary source and mobile source. Transportation (taxi, bus, motorcycle, private car and et.) sector is the main mobile source. Air pollution from transportation is the serious environmental problems in urban area, creating a number of harmful chemicals and particles that threaten human health and the natural environment. About 80% of dwellers in Europe live com from transportation sector [2-5]. Common traffic-related air pollutants in urban areas of developing countries are: Particulate Matter (PM), Carbon Monoxide (CO), Nitrogen Dioxide (NO2), Volatile Organic Compounds (VOCs) , Carbon Dioxide (CO2) , Sulfur Dioxide (SO2) and polycyclic aromatic hydrocarbons (PAHs) [6-13]. In 2002, in Tehran about 80-85% of SO2, NO2, HC, PM10 and CO emission was produced by mobile sources of pollution [14]. In recent years, greenhouse gas (GHG) emissions was increasing and it is the resulting from the use of fossil fuels, and their effects on global warming and climate change have been a serious issue, therefore, the many governments have been forced to ordain some policy and strategy to reduce and control emission air pollution. These strategies consist of management strategy and use new technology. Management strategy is the government programs that can be reduce travel demand, change travel model, encourage citizen to use public transportation, scrapping old vehicles and other policy that in continuo will describe them. Use alternative fuels, product vehicles with low emission air pollution and low consumption fuel, improve exist fuels and vehicle emission control technologies are other strategies for air pollution reduction and control.