Role of Transportation System in Managing Air Pollution within the Cities

Abstract:

Nowadays cities are increasing with the rapid urbanization due to haphazard development along the rivers, transport imports and exports to the peri-urban centers from the city centers and to the satellite towns around the cities. The fatality rates are increasing in the developing nations due to the urban air pollution, automobile pollution in the metropolitan areas with a concentration of harmful gases like chlorofluorocarbons (CFC's), carbon dioxide, methane, nitrogen oxide, lead, and several other bags of dust and gaseous particles. The rapid growth of automobiles in developing nations like India has a large impact on environmental pollution and other adverse social, physical, health and economic impacts. This paper tempts to examine the impact of urban air pollution which is happening from the increase in private vehicles from the last few decades due to lack of policy framework, traditional concepts and technologies, funds, institutional framework and inadequate management of authorities and ministries at the local, state or regional level of cities in the developing nations. The paper then discusses the role of the transportation system in managing air pollution in Coimbatore of southern India which has an adverse impact of freight movement and increases in para-transit modes and private vehicles in the city, in a way that is sensitive to understand and proposed a strategy to tackle air pollution issues in Coimbatore city.

Key Words:

Chlorofluorocarbons (CFC’s), para-transit modes, institutional framework, urbanization, policy.

Introduction:

The continuous increase in rapid urbanization of population with increase and more usage of private vehicles in the developing nations from the last few decades would also tends to increase the fatality rate of accidents near the major roads, junction with adverse effect on environment due to releasing of large amount of harmful gases from the old buses and private vehicle continuously running from morning to evening catering large population of the cities, but harmful gases i.e. Nh4, Co2, Nitrogen oxide, chlorofluorocarbons (CFC’s) released from vehicles impact the environment. India has one of the largest populations of private vehicle type and these private vehicles generate three times more greenhouse gas emissions than public transport systems. Most of the Indian cities are lacking in terms of integrated land use transport development, Transit Oriented Development (TOD), Intelligent transport and traffic management etc. For example – In Delhi's case, City enveloped in smog, back to pre-CNG levels, smog leaves Delhi gasping breath, Delhi winter smog is not an act of God. Due to the increase and low-level performance of old public transport like Bus and more private vehicles on the road lead to having a huge impact on the environment with climate change and global issues like global warming.Various studies have been undertaken by researchers, academician and policymakers on urban air pollution issues related to haphazard increase in private vehicles and their impacts on environment to tackle down the issues with the new latest technology and

strategy developed by the developed countries which is already advanced in public transport system, green transportation, smart transportation and multimodal integration which easily mitigating the air pollution and their impacts on environment which may further harm the atmosphere with harmful gases. Cities are expanding from dynamic town to metro cities to megacities, due to increase in population the demand may also differ with the supply of private vehicles and black carbon and methane are one of the most harmful gases emitted by the vehicles. PM 2.5 and PM10 particulate pollution decline and rise again due to the rapid increase in vehicle numbers. In various studies, researches carried out that shift of 3C's model will be neglected in the city with the mixed land use of urban growthi.e. connected, compact and coordinated. To adapting the more fleet of public transport in Coimbatore shows the demand for public transport with an increase in ridership also reflects the importance of the city. Coimbatore is a southern city located in Tamil Nadu District of India, which is a dynamic and second-largest city of Tamil Nadu after Chennai. Coimbatore is well connected with satellite towns around there and each of them has a potential to import and export their commodities locally, nationally and globally with a great profit, the freight movement is well organized around Coimbatore without conflicting the arterial networks of the city by retaining the essence of greenfield corridor. But only the city is having a large number of private vehicles which creates traffic congestion, parking problems and there will be no trees found in the Coimbatore in between the median of roads whether it was local or arterial, which may be a failure to absorb harmful gases and contribute a little less to the atmosphere.

Issues and Challenges:

Coimbatore Freight is a huge issue for urban air pollution and climate change in Asia and the government is taking initiatives to reduce the problems facing by freight transport. Coimbatore is one of the emerging industrial and education hubs where people came from different diversities to live permanently as an old age home, work for industries as small-scale laborer and commodities exported globally through which various Foreign Direct Investment will be happening by developed nations to support the economy of Coimbatore. So, Coimbatore will contribute the largest share in emissions of pollutants as it increases both mortality and morbidity. Old vehicles are still running instead of replacing with the new CNG vehicles to reduce more carbon emissions and footprints. Coimbatore city has around 84.2% private vehicles out of which 20% contributed to the emissions. In the case of two-wheelers, there are no statuary norms should be followed in Coimbatore except metro cities and other urban centers where there will be no checking of emissions in vehicles. More breaking and acceleration in buses by the driver is also the reason for the increase in emission levels. Out of 1000 automobiles present in Coimbatore, vehicular exhaustion of two-wheelers are 71%, jeeps and light motor vehicles are 12% and the remaining were the passengers or goods. Tamil Nadu State Road Transport Corporation (TNSRTC) will be running the old buses, the older vehicles the higher the emissions level will be in the city. Emission Level: Transportation in Coimbatore

Central and State Pollution Control Board (C&SPCB) will be responsible for all the emission-related issues in the urban areas related to construction, air and noise pollution which created a large environmental impact on the environment. National Ambient Monitoring Program (NAMP) operated 3 manual stations in Coimbatore reporting data on PM 2.5 and PM10, NO2 and SO2 with continuous air monitoring stations.From above figure 2- Emission in few cities of India shows the emission released from the passenger vehicles in million-plus cities of India and ranked according to the cities who released more harmful gases like – SO2, NO2 and NOx etc

in which Coimbatore is the more contributor of CO and HC.

A recent study carried out by the CSE and CPCB (Centre Pollution Control Board) that Coimbatore ranks high on the list of emissions released by the private and old vehicles in urban centers where Coimbatore get 5th rank in the list of urban centers in India. It recorded a PM concentration of 76 mcg/cum. In Nos pollution, Coimbatore contributed 27 micrograms/ cum, which also reveals by the control pollution and various agencies involved in the urban pollution created by the passenger vehicles that there is urgent need of Transit-Oriented Development (TOD), Electric vehicles, replacement of Old vehicles which contributing more harmful gases to the atmosphere and increase of private vehicles in urban centers like Coimbatore are the major problems. NOx is the severe harmful gaseous pollutants that contribute to the accumulation of smog through these vehicular emissions from vehicles.PM10 levels and NO2 levels (micro gm/cub.m) is the highest in Salem and Coimbatore which shows that both municipalities needs and urban transport strategy developed by the experts and soon deployed on the ground level by various ministries involving in the emission of air pollution from vehicles in Coimbatore. Coimbatore 2015 data shows the PM 2.5 emissions released from the private vehicles and accumulated in the air with various intervals showing which area of Coimbatore is facing severe urban air pollution level within the city with color coding of yellow, orange and red which replicates the level of emission from low to high in the city. Whereas In 2015. The total estimated emissions by sector for 2015 (units - – mil. tons/year for CO2 and tons/year for the rest) of Dust, Construction waste, DGST, Brick kiln, residential emissions from other uses, industries and transport with the contribution of harmful gases like – PM 2.5, PM 10, BC, OC, NOx, CO, VOC, SO2 and CO2 in which you can see the emissions contributed in the air from transport 21% is the challenging issues globally for forming a climate change and global warming.

Source 6-From the year 2015 to projected 2030 the emission tons/year is continuously increasing with the arithmetic speed of emission level PM 2.5 present in the air releases by vehicular traffic due to traffic congestion, lack of public transport, Electric vehicles and integrated land use transport with compact development and transport is the major contributor of Pm 2.5 and PM 10 emissions to the air after industries.

Finding and Result –

In the case of Coimbatore, sector-wise share of PM 2.5 concentration in 2015 will be the highest contributors from the outside to the airshed with 32.6% and transport is of 18.3% and same share in tons in 2015 and 2030 (projected) 3000 (2015) and 4800 (2030) of transportation sector PM 2.5 emission.

1. The morbidity and mortality contribution of vehicular emission highlighting transport sector and industries in Coimbatore is the main reason for urban air pollution.
2. Freight corridor is importing and exporting the larger commodities nationally or globally with the movement of old vehicles which make the negative impact of a black carbon footprint on the environment and chasing the challenge to climate change and global warming.
3. In Coimbatore, there is a growing need of promoting public transport, Non-motorized transport, pedestrianization as a part of the urban development along with the transport infrastructure plan to reduce dust particulates from the environment.

4. By 2025, due to the provision of Old vehicles largely playing on the road for the movement of passengers and commodities for a larger time also affects the fuel policy introduced by the government and other new CNG buses.
5. Car Pooling like- OLA and UBER is the new adaptive mechanism to be used by many million-plus cities, it helps people to take a ride in a shorter distance and easily available of the vehicle at the same time, nowadays makes a congestion zone impact in a city to adopt their service only without bothering anyone concerns.
6. Development causes transportation corridor but also enhances the increase in low-cost income private vehicles with the more demand of passengers as well as the vehicle.

Strategies to control Air Pollution within Cities: Coimbatore -

To control and reducing the air pollution, for there are numerous measures for tackling urban air pollution due to the increase in private vehicles and use of Old diesel vehicles, which saves the money but harm the environment.

Phasing out of Old Vehicles – Banned on every Old vehicles in the market from small scale to freight with the large amount of usage in the market, CNG and electric vehicles replace the old vehicles to combust the emission releasing from the old vehicle which gives a black carbon to the atmosphere in the form of footprint as well as forming global warming which harms the environment.

Augmentation of Public Transport and Integrated Land Use Transport Integration – Use and Provision of Public transport should be made mandatory in each and every dynamic towns and cities, increase more route and fleet size of City buses, BRTS, MRTS with proper multi-modal integration so that a large number of people traveled from one place to another with the provision of first and last mile connectivity within the city with proper integration of BRT, MRT, IPT with the land uses with more trips attract towards the service center and more revenue generated should be utilized on the transport infrastructure.

Provision of Smart and Green Transportation – Encourage people in the city to go for public transport (green transport) rather than private to maintain the ecological essence of the environment like – Eco-friendly transport which impacts zero percent to the environment in any form of harmful gases or footprint.

Traffic Planning and Management – Congestion pricing should be applying to decongest the road near the commercial area and provision of signalized and un-signalized junction should be located at every rotary and major junction in the Coimbatore to avoid conflicts and smoothly manages the traffic with the smart tag on toll plaza to avoid queues and manages the traffic management.Taxes on fuels and parking – High taxes should be made by government on fuels to less use of private vehicles and shift from private to public transport and taxes on parking if the vehicle is parked on the streets, so government should apply a tax on it, so that people buy vehicle according to their income and do not park on the street if the taxes should be applied by the government on-street parking.

Segregated Bicycle lanes – Promotion of eco-friendly transport for safe mobility and accessibility.

To introduce and enhance the operation of non-polluting vehicles like- Trams, Metro, BRTS and monorails should be encouraged in every city by the transport departments and ministries of India.