Sustainable Smart Solutions for City of Faridabad –
A Case Study Addressing Urban Infrastructure Problems

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Abstract

This paper presents the city assessment of Faridabad, about what are the problems that are causing a barrier to convert it into a smart city, by geographically surveying the various parts of Faridabad. Then analysing those problems step by step and finding out the proposed solutions for them and how to implement the solutions.

INTRODUCTION

This paper sees a smart city not as a status of how smart a city is but as a city's effort to make itself smart. The connotation of a smart city represents city innovation in management and policy as well as technology. In this research, it is discussed how innovation in management and policy can be put in use to turn a city into a smart city. This paper aims to fill the research gap by building a comprehensive framework to view the smart city movement as innovation comprised of technology, management and policy. This particular study focuses on the issues the City of Faridabad has and how they can be addressed to turn it into a smart city.

Faridabad is situated on the Delhi – Mathura National Highway No. 2 at a distance of 32 km. from Delhi, at 28° 25' 16" north latitude and 77° 18' 28" east longitude. The Yamuna flows very near to the city at its northern side and moves away as it goes south.
NH 2 from Delhi-Mathura passes through the length of the city and is the central axis of the city of Faridabad. Further, NH 3 and NH 4 also pass through the city. It is connected with Gurgaon by the Gurgaon-Faridabad road. As part of NCR proposals, connectivity is proposed for improvement through the western peripheral expressway (Kundli-Manesar-Palwal “KMP”) and eastern peripheral expressway (Kundli-Ghaziabad Palwal “KGP”).

Faridabad, being a constituent part of NCR is home to one of the largest industrial estates of Asia which houses a large number of manufacturing industries. Economy of Faridabad is more or less dependent on Industry. In this research paper, focus was on certain prominent urban problems of the City so that by those issues if addressed can turn Faridabad into a Smart City. The major problems pertaining in the city are listed as below:

- Problems arising due to Urban Economy which includes a large no. of industries in this area and various types of environmental problems arising.
- Problems Arising due to mismanagement of Solid and Sewerage Waste.
- Traffic Congestion and the problems related to Road Transportation.

**URBAN ECONOMY**

Urban economy usually consists of Industries and land use. It is one of the most important factors contributing in Sustainable Development of a city as it raise the capital of the city as well as provides employment directly or indirectly to large number of people in the city. Faridabad is the industrial base of Haryana and all the major industries of Haryana are located in Faridabad. Faridabad has in all 15,000 medium, small and micro enterprises providing employment to almost half million people in and around the area. Industries provide Foreign Direct Investment which in turn help in raising the Expenditure of the city and help in advancement in overall economy and paves the way for Sustainable development.

**Major Issues Pertaining to Industrial Growth of Faridabad**

- **Storage and Power Use**
  This is a common phenomenon across the NCR; it has become a major issue for the existing industrial set-up as well as for those who plan to set shop. Also, the industry is faced with the challenge of water supplies in future in view of the current situation of non-perennial sources and continuous depletion of ground water sources. Alternate sources for augmentation of supplies, coupled with technology up-gradation and a drive towards reduced industrial water consumption/ recycling are of paramount importance.

- **Incompatible land uses**
  Faridabad today is dotted with several industrial units, set up in non-confirming land use categories, primarily residential areas.
• **Implementation of long-term strategic proposals of NCR**
For being part of NCR, Faridabad has been identified for a varied number of proposals towards mutually benefiting economic growth like, the Common Economic Zone, Alternate wholesale Market for auto parts, the KMP and KGP Peripheral expressway. However, a time-bound action plan for the implementation of the same is necessary to implement the proposals so that the individual cities don’t lose out due to delay in implementation of these proposals.

**Solutions for industrial problems**
- An industrial area should be well planned and divided into sectors according to the type of industries.
- The location should be outside the city specifically so that it does not harm the health of the citizens.
- Industries have a large impact on city’s environment is the most critical determinant of the quality of life of its inhabitants and consequently of urban productivity. Air, water, greenery and noise levels are the constituents of urban environment.

In order to provide overall development of the city plan can prove effective.

**Necessity of Development Plan:**
1. To control the development of various industries in a systematic way.
2. To discourage the growth of town in an unplanned and unscientific way.
3. To give a perspective picture of fully developed plan.
4. To limit to certain extent the unprecedented flow of rural population to urban area.

**SOLID AND SEWAGE WASTE MANAGEMENT**
Rapid urbanization, increasing commercial and industrial activities and changing life styles in Faridabad are leading to a steady increase in the generation of solid waste. MCF is responsible for the collection, transportation and disposal of all solid waste generated in the city, except the untreated bio-medical waste and hazardous industrial waste, which is taken care of by the respective generators. MCF organizes the collection and transportation of the waste through a team of its own conservancy workers and a fleet of vehicles and dumper-placers. The waste collected is disposed at various dumping yards without any treatment.

**Collection of Solid Waste**
There are at present 342 collection points in the city provided with community bins, open bins, dumper bins, etc. The city has been divided into four sewerage zones on the basis of the topography of the area and other major barriers. The 91 sectors planned for the city in the Development Plan are covered under these sewerage zones. The Sewerage master plan was prepared in 1992 to cover the urban sable area proposed in the Development Plan for Faridabad. The master plan has proposed two sewerage treatment plants, one for zone – I and III and the other for zone II & IV.
Existing Sewerage System
The present quantum of sewerage generated in the city is understood to be in the range of 200 MLD which is approximately 80 percent of the water supply. To convey this sewerage to various intermediate and main pumping stations for treatment purposes, there is a sewerage network of about 638 km. covering 52 percent of the total road network of the city. This however, doesn’t present the true picture of system coverage, as the road network in the city itself is falling short of requirement. In terms of population coverage, the network is understood to be covering only 50% of the city population implying that a large quantum of sewerage is flowing into the open drains and ultimately into the river Yamuna untreated. Against the 16 proposed SPSs for the four zones, 13 are in place at present. The sewerage transmitted through the system is treated in three sewerage treatment plants (STP) with a combined capacity of 115 ML.

Issues in Solid Waste Management
1. A limited extent of the city area is covered by door-to-door collection, including source segregation. However, even this effort has been rendered unproductive as at the point of collection for transportation; the segregated waste gets mixed up to a large extent.
2. The shortfall in the required capacity of the fleet by about 35 MT is exerting pressure on the present fleet of vehicles through over utilization in terms of the number of trips made. Also the non-availability of intermediate transfer stations is increasing the number of trips and thereby the O&M expenses on the fleet.
3. Only two dumper placers are available with MCF. There is a need to increase the number of dual loaded dumper placers (DLDPs) and to put in place intermediate transfer stations, in order to do away with the bin system of secondary collection and transportation.
4. Crude dumping is resorted to at the disposal sites due to non-availability and non-provision of infrastructure for scientific disposal.

Solutions for Solid and Sewage Waste Management
1. There is a need to increase the number of dual loaded dumper placers (DLDPs) and to put in place intermediate transfer stations, in order to do away with the bin system of secondary collection and transportation.
2. Door to Door collection of waste.
3. Availability of infrastructures for scientific disposal.
4. Increase in intermediate stations that will reduce the number of trips and hence the expenses to dispose the waste.
5. The system will need major refurbishment and augmentation as all the newly-added areas are lacking completely in MSW infrastructure. The city also needs to acquire a large fleet of vehicles and dumper placers to effectively implement the MSW Rules, 2000 and make the city a clean place.
6. Infrastructure development for sanitary landfill and composting at the proposed site will need to be completed in the next two years.
Transport demand in Faridabad city has increased substantially, due to increases in population as a result of both natural increase and migration from rural areas and smaller towns. Availability of motorized transport increases household income, and increases in commercial and industrial activities further add to transport demand. Greater congestion and delays are prevalent in Indian cities and indicate the seriousness of transport problems. A high level of pollution is another undesirable feature of overloaded streets.

Though there are many issues which make a city sustainable but Road safety is a major concern in Faridabad city. In this project we have discussed the major issues and seriousness of the problems which are responsible for road congestions and traffic problems in Faridabad city. We will also suggest some useful and practical suggestion which can be implemented for the same.

Road Network in Faridabad
The MCF area is characterized by the old Faridabad, Ballabgarh and the New Industrial Town (NIT). The Delhi-Mathura NH 2 is the spine of all road networks in the city. As presented in the adjacent figure areas to the east of NH 2 mostly follow the grid-iron pattern (except for core village areas which have a geometric road network with narrow lanes and high density concentrations). These are Old Faridabad and Ballabgarh areas. Areas to the west of NH 2 mainly comprising of NIT have a mix of organic and grid-iron pattern of roads. The road network in the MCF area functionally comprises arterial roads, collector roads and local streets.

The main arterial roads either start or end on the NH 2. Other highways in the city include NH3 and NH4, which also branch out from NH 2. State highways include the Faridabad-Gurgaon highway and the Ballabgarh-Sohna Highway.

Major Congestion Points In The City Of Faridabad
Mainly the city faces the congestion problems on NH2 (mathura – ballabgarh ) which is the spine of the city. And the congestion points are

1. Badkal flyway
2. Bata chowk
3. Bata fly over
4. Neelum fly over

- Apart from this sector 13,14,15,18,19,22, do not get affected by traffic while sector 8,9,10,11,13 have the problem of traffic congestion
- The new industrial town also faces problems due to the presence of market area, malls and shopping centre nearby therefore high traffic is observed in the locality.
- While old Faridabad is highly affected by the large number of vehicle causing traffic problems. There are very less number of traffic signals. The road is very wide. The vehicles are parked on road side because parking facilities are not available at many places where it is needed.
• Metro services are available only from badarpur border to YMCA chowk which further need to be extended till pulwal.

**Major Causes of Traffic Congestion in Faridabad**

1. Substantial increase in the number of vehicles on Faridabad roads in recent years.
2. The road length in Faridabad has increased at the rate of 4.53% per year, which, of course, is not in pace with the growing population. It is reported that the road density in Faridabad is around 155 km per 100,000 population and about 80 vehicles per km
3. At the intersections, the cycle time ranges from 120 to 180 seconds, this leads to long queues, especially in the peak hours.
4. Another major cause is that Faridabad roads are characterised by mixed traffic, which include, personal vehicles, buses, trucks, three-wheelers, two-wheelers, including animal-driven carts and pedestrians.

**Proposed Solutions for Urban Transport**

• The city hardly has any road infrastructure like ring road or bypass road which add up to the traffic problems.
• Metro facilities should be extended up to palwal at its earliest so as to improve the public transport.
• Installing an intelligent transportation management system that will continuously monitor the traffic situation and direct over 600 traffic signals to function according to the flow of traffic. By keeping the traffic moving, the system will help reduce fuel consumption and air pollution.
• Modern metros for safer mobility and to reduce the congestion on roads which will prove effective while connecting the city in smaller links for example the proposed project of connecting Faridabad with the adjoining area of Noida and Greater Noida.
• E-Governance: Installing Cameras at important checkpoints of the city to have effective control on the governance and controlling thefts and crimes in the city and to make it crime free and sustainable.
• Cycle tracks can be introduced as for example in Chandigarh and Noida so that the pedestrian and cycle traffic can be reduced on road simultaneously.
• Rotaries can be provided at the intersections to control the flow of traffic and accidents occurring on roads.

**CONCLUSION**

Rapid urbanization creates a set of significant challenges to governments, private enterprises, civil society, and communities. Collective action by and across these institutional groups can ensure a convergence of entitlements and public policy, enterprise and collective action to support this multi-dimensional transition to an urban world without significant economic, social or environmental disruption. The proposed framework to reduce urban poverty in all its forms, end slum formation,
increase productivity, and promote conditions for global sustainability, cities will need to ensure universal access to basic urban infrastructure and services: housing, water, sanitation, waste management, low-carbon energy and transportation, and information and communication technologies. Urban areas must invest in strategies to increase resilience to disasters, extreme weather events, and other threats of climate change. Transformational technologies, such as information and communications technologies, can help improve city governance, energy and resource use efficiency, and delivery of urban services, and create new employment opportunities. Equitable and efficient urban land and resource use is essential, as is nurturing urban ecological integrity and its linkages to rural and regional systems. To harness the potential of sustainable urbanization, city governance will have to be improved in virtually every country. Metropolitan areas and urban local governments will be at the centre of decision-making and therefore need to be empowered, but they must work with many actors: e.g. national governments, local authorities, businesses, knowledge institutions, and civil society. Together all these actions can mobilize the needed financial, institutional and human resources across a broad range of urban issues, such as jobs, housing, services, and infrastructure. The success of the smart cities will be determined heavily by the quality of urban governance, sound investments, and cities’ ability to innovate.

In order to make the city (Faridabad) sustainable and smart, below issues were analysed.

**Research mainly focused on the -**

1. Urban Transportation
2. Solid waste Management
3. Urban Environment

In the Urban Transportation we counted mainly on Road Transportation which further suggests on congestion points and accident prone intersection and found out the solutions for the respective problems.

In the Solid waste management, we analyzed the highly waste generating areas, and what needed to be done to manage the waste and also get rid from its harm.

In the Urban Environment, we discovered the areas and industries which needed to be highlighted which are causing serious pollution problems and there is inadequate land use and their proposed solutions.

**REFERENCES**


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