PROPOSAL FOR PUBLIC ROUTE NETWORK IN URBAN TRANSPORT PLANNING - A CASE STUDY OF ANKLESHWAR, GIDC

[1]Aakancha S Kumar, [2]Jayesh Juremalani, [3]Khushbu Bhatt

[1]M. Tech Student, [2]Asst. Prof. Civil Engineering Department, [3] Asst. Prof. Civil Engineering Department

[1]Transportation Engineering

[1]Parul Institute of Engineering and Technology, Ankleshwar, India

Abstract : Public transportation is largely considered as a viable option for sustainable transportation in urban areas, offering advantages such as mobility enhancement, traffic congestion and air pollution reduction, and energy conservation while still preserving social equity considerations. Nevertheless, in the past decades, factors such as socioeconomic growth, the need for personalized mobility, the increase in private vehicle ownership and urban sprawl have led to a shift towards private vehicles and a decrease in public transportation's share in daily commuting. Planning and designing efficient public transportation network is necessary to increase it more use and awareness. Network designing is an important part of the public transportation operational planning process. The paper focus on the four routes proposed for the public transportation planning of the study area.

Index Terms - Public transport, BRTS, Urban transport planning, Route proposals.

I. INTRODUCTION

The constant grow of wealth of the society in the urban areas results in a natural tendency to move residents' dwellings away from city centers to the suburbs. This effect is called "urban sprawl" or suburbanization. The residents of suburban areas travel on a regular basis to the city center (schools, jobs, places of entertainment) by private cars. This results in the overall increase of movements and congestion of the roads connecting suburbs with the city centers, especially during peak hour. This situation is very burdensome for various stakeholders, such as: road users, residents of urban areas and public transportation operators. High level of congestion, generated in particular in the areas of heavy traffic, in addition to producing high travel cost, leads to increased emissions of noise and pollution. One of the ways to reduce high level of congestion and its negative effects is promotion of public transportation which can take over a substantial portion of travels previously carried out by private cars. In 2002 the study noted that "private vehicles emit about 95 per cent more carbon monoxide, 92 per cent more volatile organic compounds and about twice as much carbon dioxide and nitrogen oxide than public vehicles for every passenger mile travelled". Supporters of the green movement usually advocate public transportation, because it offers decreased airborne pollution compared to automobiles.

Using public transportation can result in a reduction of an individual's carbon footprint. A single person, 20-mile (32 km) round trip by car can be replaced using public transportation and result in a net CO_2 emissions reduction of 4,800 pounds (2,200 kg) per year. Using public transportation saves CO_2 emissions in more ways than simply travel as public transportation can help to alleviate traffic congestion as well as promote more efficient land use. When all three of these are considered, it is estimated that 37 million metric tons of CO_2 will be saved annually. Another study claims that using public transit instead of private in the U.S. in 2005 would have reduced CO_2 emissions by 3.9 million metric tons and that the resulting traffic congestion reduction accounts for an additional 3.0 million metric tons of CO_2 saved.] This is a total savings of about 6.9 million metric tons per year given the 2005 values.

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II. STUDY AREA

The study area selected is the Ankleshwar city (GIDC).

Ankleshwar is a city and a municipality in the Bharuch district of the state of Gujarat, India. The city is located ten kilometers from Bharuch. The town is known for its industrial township called GIDC (Gujarat Industrial Development Corporation). Ankleshwar has an office of the ONGC (Oil and Natural Gas Corporation Limited). Ankleshwar has over 1500 chemical plants, producing products such as pesticides, pharmaceuticals, chemicals and paints. As of 2011 India census Ankleshwar had a population of 140,839. Males constitute 53% of the population and females 47%. 13% of the population is under 6 years of age. Ankleshwar is connected by Indian National Highway 8 (Mumbai to New Delhi) and by the Western Railway Division of Indian Railways. The railway division runs the broad gauge train services to Rajpipla. The 133-year-old Golden Bridge connects Ankleshwar to Bharuch across the Narmada on the station front while a new bridge connects the highway, the other bridge on the highway is now ready to use. Ankleshwar railway station is centrally located at the intersection of NH8 & Station Road. Ankleshwar City Bus stand is located on Station Road (i.e. located in the City, the western section.

III. RESEARCH METHODOLOGY

The method used in the survey process is home interview survey method.

Home interview survey is one of the most reliable types of surveys for the collection of origin and destination data. The information on the interview includes number of trips made, their origin and destination, purpose of trip, travel mode, time of departure from origin and destination, purpose of trip, travel mode, time of departure and so on. The information on house hold characteristics includes the types of dwelling units, number of residents, age, sex, vehicle ownership, number of drivers, family income and so on.

A numbers of techniques are available for the home interview survey. The **house hold information** contains information such as address, size of household, age and sex structure of household, earning members, occupation, place of work, number of motor vehicle owner, house hold income and so on. The **journey data** contains information on all journeys made in a day including the origin and destination of journeys, purpose of the trip, mode of travel etc. the forms are generally standardized for this purpose and the questions are structured

carefully to avoid ambiguity. The usual practice is to have the household information in front of the form and the trip information on the back of the form.

IV. SURVEY AND DATA COLLECTION

For the home interview method the questionnaire survey was conducted for 384 samples for 150000 of population. The questionnaire format has three sections 1) socio – economic characteristics, 2) work trip characteristics, 3) shopping trip characteristics. The survey form was then analyzed using Microsoft excels through bar graphs and charts. The charts give the proper and precise idea about the survey conducted with the leading and following percentages.

V. DATA ANALYSIS

- In the survey procedure 65% consists of male and 35 % consists of female members.
- The age analysis leads with 25.27 % for the age group of 24 to 30 years.
- The monthly income group of 30,000 – 40,000 leads by 40 %.
- The choice of vehicle by the commuters for the work trip, motor bike is preferred by 31.47% of the people which is highest and then is followed by shared auto with 28.94% and 26.60% is preferring car.
- The choice of vehicle by the commuters for the shopping trip where car is preferred by 31.25% of the people which is highest and then is followed by motor bike with 22.30% and 18.77% is preferring bike.
- 23% of the people travel at 9:00 am and 22 % of the people travel at 8:00 am.
- 31.78% of the people travel at 6:00 Pm and 30.11% of the people travel at 7:00 pm.
- Maximum people origin their work trip form ambe green city which follows by kaprodra patia also some of the work trip origination include from garden city, rajdeep park, Ankleshwar station.
- Maximum people have sardar park as destination of their shopping trip form which follows by jaldhara chock, ragini.

IV. RESULTS AND DISCUSSION

From the above survey analysis the following four routes for public transport can be proposed for easy and quick travelling movement with comfort and safety also reducing the level of air pollution, noise pollution, congestions and travel time delay.

- Route 1:-
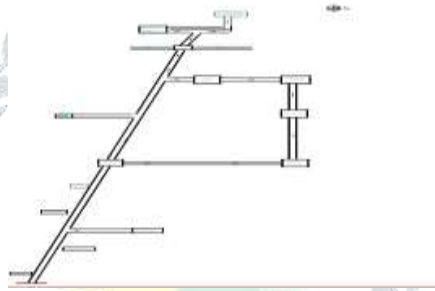
- The distance between each stops / blocks of route 1is given as below (In Km)
    1) Ankleshwar GIDC railway station to GIDC bus station --- 1
    2) GIDC bus station to Valia Chokdi --- 0.2
    3) Valia Chokdi to Manav Mandir---2.8
    4) Manav Mandir to GIDC police station --- 1.3
    5) GIDC police station to Sardar Park --- 0.3
    6) Sardar park to Jaldhara chokdi ---- 2.3
    7) Jaldhara chokdi to kapodra patiya --- 0.3
    8) Kapodra patiya to swastik park --- 0.2
    9) Swastik park to Ambe green city ---0.5
    10) Ambe green city to garden city --- 0.2
    11) Garden city to gopal nagar --- 0.1
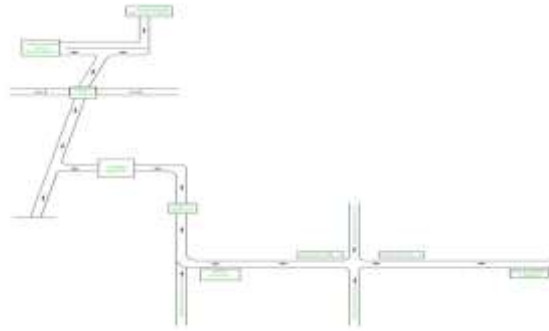
- Route 2:-
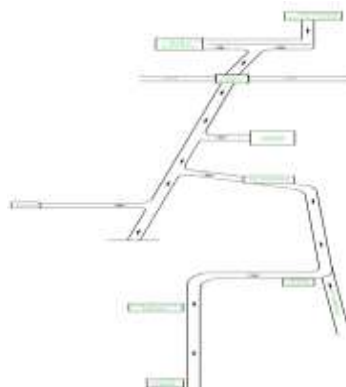
- The distance between each stops / blocks of route 2 is given as below (in km)
    1) Ankleshwar GIDC railway station to GIDC bus station --- 1

2) GIDC bus station to Valia Chokdi --- 0.2
3) Valia Chokdi to Manav Mandir---2.8
4) Manav Mandir to Jaldarshan soceity --- 0.5
5) Jaldarshan soceity to Gattu school ---- 0.6
6) Gattu school to Pashupatinath mandir --- 0.2
7) Pashupathinath mandir to Jaldhara chokdi --- 0.1

- Route 3:-

- The distance between each stops / blocks of route 3 is given as below (In Km)
    1) Ankleshwar GIDC railway station to GIDC bus station --- 1
    2) GIDC bus station to Valia Chokdi --- 0.2
    3) Valia Chokdi to Manav Mandir---2.8
    4) Manav Mandir to Jyotirao Phule Marathi school ---1
    5) Jyotrao Phule Marathi school to Gattu school --- 0.1
    6) Gattu school to Sardar park 1 ---- 0.5
    7) Sardar park 1 to Sardar park 2 ---- 0.2
    8) Sardar park 2 to 500 quarters ---- 0.1

- Route 4:-

- The distance between each stops / blocks of route 4 is given as below (In Km)
    1) Ankleshwar GIDC railway station to GIDC bus station --- 1
    2) GIDC bus station to Valia Chokdi --- 0.2
    3) Valia Chokdi to Manav Mandir---2.8
    4) Manav Mandir to Kapodra Patiya --- 1.7
    5) Kapodra patiya to swastik park --- 0.2
    6) Swastik park to Ambe green city ---0.5
    7) Ambe green city to garden city --- 0.2
    8) Garden city to Gopal nagar --- 0.1
    9) Gopal nagar to Suncity bunglows --- 2.6

❖ So from above routes we can say conclude that if public transport route is designed in such a way will help us reduce the traffic congetion, noise pollution, air pollution and travel delay time.

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