

Public Transportation System in Chandrapur City

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ABSTRACT

As we know the population of Chandrapur City has increased so far in this years and with that has increased the vehicles causing high traffic volume & rise in pollution. But the transportation system in Chandrapur City is still the same. To reduce the traffic volume & pollution, we have to study & design the new transportation system in Chandrapur City. The system would be as similar to Nagpur City with the implementation of Star City Buses. In this Study we would first compare the speed of various vehicles. Collection of population details of Chandrapur City, approximate number of vehicles running on road, collection of data with respect to Ticket fares in Nagpur City- whether it is according to Kilometers or places to be reached, calculation of Ticket Fares for Chandrapur City on the basis data collected. By all these, the best mode of transport in City can be studied.

Keywords : Public Transportation System, Urban Transportation System, BRTS

I. INTRODUCTION

The Population of Chandrapur City according to 2011 census was found to be 2,194,262 which is growing rapidly. The Population of city in last two decades was 1,771,994 in 1991 & 2,071,101 in 2001 according to Municipal Council & Census Town. This gives a clear idea that the population of Chandrapur city is increasing with regular growth. The Road Pattern and Transportation System of city is still the same. Somewhere, the space for proper parking is also not provided due to which the problem congestion and traffic in Chandrapur City increasing. With addition to this, there is no proper decided Transportation System in our Chandrapur District.

Number of Major Cities which had larger population likewise Delhi, Nagpur, Kolkata, Pune, Indore, Bhopal have started their own mode of transportation such as LRT, BRT, Metro Railways, etc. to overcome their problem.

The other problem is Pollution. The vehicle traffic in City has increased due to population. Public is using their personal vehicles for their comfort zone.

Due to this reason, the number of vehicles is growing, the vehicles emits gases like Carbon Monoxides, Nitrogen Oxides, Particulate matter & hydrocarbons, in which Carbon Monoxide creates major health problem due to pollution.

The following figure shows the Traffic & Congestion at Gates of Chandrapur.

Major problems affecting Chandrapur District:

As discussed earlier in General Section, the major problems affecting Chandrapur District are

1. Population – Growth of population in last decades.
2. Vehicular Population – Growth of vehicles in city.
3. Pollution – Air Pollution consisting Vehicular Pollution, Water Pollution, Sound Pollution and more.
4. Industrial growth – CSTPS, MIDC creating major problems.
5. Traffic & Congestion – Mainly due to growing no. of vehicles & insufficient parking area.
6. Historical monuments – Creating problems for vehicular passing.

II. SELECTION OF SITE

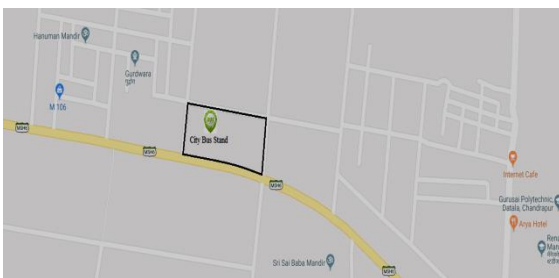
Site Selection:

After studying about all the study parameter, the main work is to select the site. Selecting the site is as important as designing the PTS. The first step in the design part comes the Site Selection.

Where is the Site located?

According to the study, the inner part and outer part City area of the Chandrapur is so congested so that vehicles can't move properly. Keeping all this points in mind, the site is selected away from the city area. It is located in Datala village, Near Mhada Colony.

The location of the site is shown in the map below:



Map No.1 –Location of the site

Why the Site is selected?

There are number of reasons to select the site in the Datala village. Some of the points are described below:

1. Connection of road: The site is touched to State Highway MSH 6. The road is getting widened in the coming years.
2. Locality: The locality of that area is developing as the site comes under New Chandrapur. The population of that area is increasing, so to connect people from New Chandrapur to Old Chandrapur, this option can be selected.
3. Public places: Number of Public places like Schools, Temples, different type of market have been started.

So these are the major reasons to select the site in Datala village.

Route Mapping:

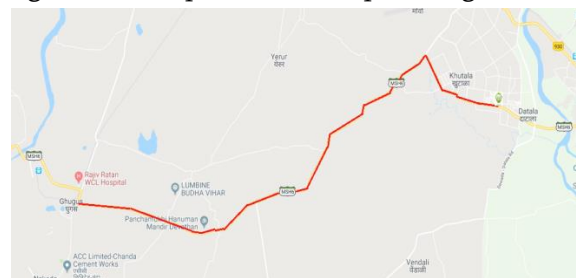
Now, after selecting the site the step is to select the routes. We have selected number of routes, which can transportation faster & easier. There are 10 routes given below:

1. City Bus Stand to Ghugus
2. City Bus Stand to Mul
3. City Bus Stand to Warora
4. City Bus Stand to Rajura
5. City Bus Stand to Moharli
6. City Bus Stand to Pathanpura
7. City Bus Stand to S. T. Workshop

The maps of different routes with their Origin & Destination points are shown below:

1. City Bus Stand to Ghugus:

Center Bus Stand – T point agro Pvt. Ltd. – MIDC - Multi Organics Pvt. Ltd. –Hi-tech College of Pharmacy – Wandhari – Nagala –Refined Soya Oil Factory- Anturla – Nanda sq. – Panchamukhi Temple – Shegaon Road Sq. – Chandni Sq. – Ghugus



Map No.2: City Bus Stand to Ghugus

2. City Bus Stand to Mul:

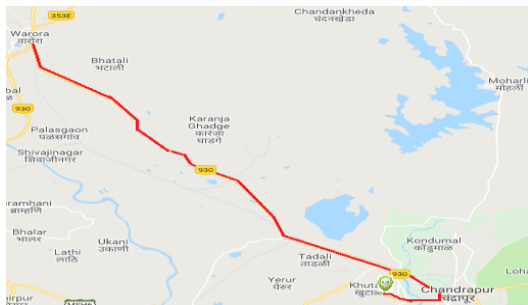
Center Bus Stand – Datala - Dewada Sq.- Balaji Temple – Chanda Public School – Ramnagar – Watertank – Sawarkar sq - Aadarsh Petrol Pump – Bengali Camp – Nehru Nagar T-point – Indira Nagar – MEL – Lohara – Ganta Chowki – Chichpalli –Ajaypur T-point –Gondsawar – Janala T-point – Agdi – Kesala Ghat – Railway Station – Tahsil Office Mul – Gandhi Sq Mul.



Map No.3: City Bus Stand to Mul

3. City Bus Stand to Warora:

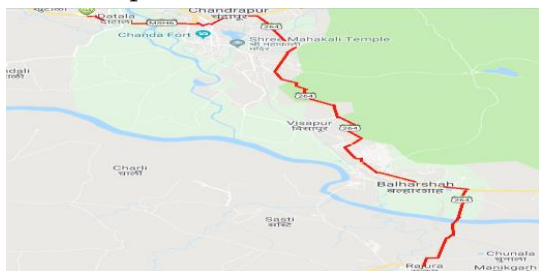
Center bus stand – Datala - Dewada Sq – Balaji Temple- Chanda Public School – Ramnagar – Warora Naka – Janta College – Bapat Nagar – Tristar Hotel – Yashwant Nagar – Padoli sq- Morwa – Tadali Sq.- Urjanagar -Ghodpeth – Lonara – SSCET College – Sumthana – Bhadrawati – Kesurli – Kadholi – Kiloni – Takli – Nandori – Sakhardoh – Ekarjuna – Borda – Warora - Anandwan Sq.



Map No.4: City Bus Stand to Warora

4. City Bus Stand to Rajura:

Center Bus Stand – Datala - Dewada Sq.- Balaji Temple – Chanda Public School – Ramnagar – Watertank – Sawarkar Sq – Aadarsh Petrol Pump- Bengali Camp – DRC Club – Babupeth – Junona Sq – GEC – APJ Garden – Sanmitra Sainik Vidyalaya – Visapur – Kala Bhavan – Ballarpur – Railway Station – Bamni –T- point – Hanuman Temple – Rajura – Gadchandur T-point.

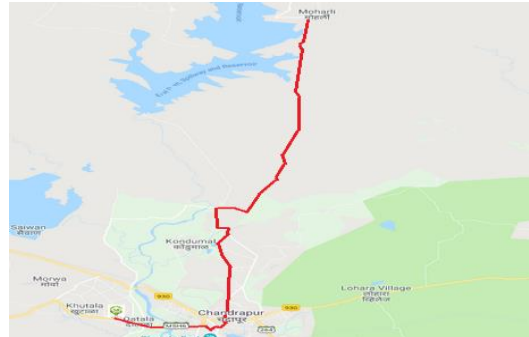


Map No.5: City Bus Stand to Rajura

5. City Bus Stand to Moharli:

Center Bus Stand – Datala - Dewada Sq.- Balaji Temple – Chanda Public School – Ramnagar –

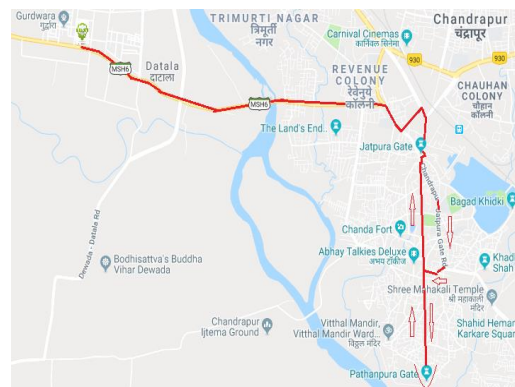
Watertank – Sawarkar sq.- Tadoba T-point – Dhande Hospital – Matoshri School – S.T. Workshop – Major Gate – Durgapur - Shakti Nagar – Urjanagar Gate – Bhatadi Mine – Padmapur – Agarzari – Government Resort – Moharli



Map No.6: City Bus Stand to Moharli

6. City Bus Stand to Pathanpura:

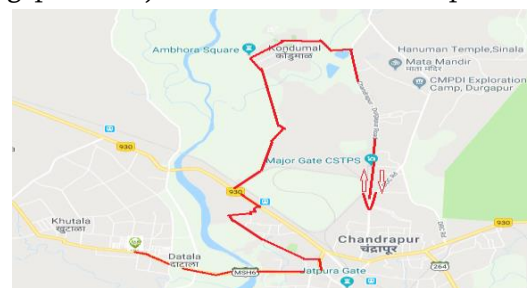
Center Bus Stand – Datala - Dewada Sq.- Balaji Temple – Chanda Public School – Ramnagar – Watertank – Z.P.- Jatpura Gate – Kamla Nehru Sq.- SBI Bank – Girnar Sq.- Gandhi Sq. – Jod Deul – Pathanpura Gate – Gandhi Sq. – Chhota Bajar – Jatpura Gate – Water tank – Center Bus Stand.



Map No.7: City Bus Stand to Pathanpura

7. City Bus Stand to S. T. Workshop:

Center Bus Stand – Ramnagar – Ambedkar College T-point – Zilla stadium – Akashwani – Haveli Garden Colony – Somayya Polytechnic – Wadgaon -Tristar Hotel Sq.- Sai ITI College – Urjanagar – Shakti Nagar – Durgapur – Major Gate – S. T. Workshop.



Map No. 3.8: City Bus Stand to S. T. Workshop

III. METHODOLOGY

Map Study of Chandrapur District :

In Map Study of Chandrapur, the topics like Roadways, Road Width & Road Pattern are described & discussed. As the Chandrapur has a larger area, there is so much to study about it.

The following are the existing road networks connecting Chandrapur :

1. State Highways passing through Chandrapur –
 - MH SH 233 :- Chimur – Warora – Wani – Rajani – Kelapur – Parwa.
 - MH SH 264 :- (From Nagpur via NH 7) – Jamb – Warora – Chandrapur – Rajura – Maharashtra – Telangana Border (112 km)
2. Major State Highways passing through Chandrapur –
 - MH MSH 6 :- Maharashtra – Madhya Pradesh border – Paratwada – Amravati – Yavatmal – Chandrapur.
 - MH MSH 9 :- Nagpur – Umred – Nagbhid – Chandrapur.
3. National Highways passing through Chandrapur –
 - NH930 :- Near Purur connecting Balod, Kusumkasa, Kumhari, Manpur – Maharashtra border (116 km)
 - NH 44 :- Nagpur – Hyderabad – Bangalore (512.65 km)

The following are the road networks which are sanctioned as State Highways :

1. The construction work for MH SH 233 passing through Chandrapur had started.
2. The construction work for new SH 372 connecting Padoli - Datala – Dewada – Hingnala - Shioni – Hadasti – Pawani – Rajura
3. The construction work for MDR 39 connecting Sakharwahi – Yerur – Wandhari – MIDC – Datala – Chandrapur Road

Road Width:

The term road width refers to how wide a road is. It depends on what type of road is being measured.

1. For Single lane – 3.75 m

2. For Multilane – 3.5 m per lane
3. For MDR, the total road width should be 15 m
4. For ODR – 3.75 m
5. For MDR – 3.5 m

The table shows standard Road width of different areas:

Table No.1: Standard Road width of different areas

Area	LHS(in m)	RHS(in m)
Nehru Nagar	7	7
Krishna Nagar	7	7
Check Post	3.5	3.5
Ballarpur Road	7	7
Dhande Hospital (Nagpur Road)	7	7
Datala	7	7
Origin (Mhada Colony)	3.5	3.5
S.S.C.E.T College	7	7
Jatpura Gate	7	7
Anchleshwar Gate	3.75	3.75
Balaji Ward	3.5	3.5
Ambedkar Sq	3.5	3.5
Revenue Colony (Binaba Gate)	3.75	3.75
Revenue Colony (Datala Road)	7	7
Ramnagar Sq	3.75	3.75
Water Tank	3.75	3.75
Siddhart Hotel Premium	7	7
Police Station	7	7
Success Point, Police Ground	7	7
Nilam Clothes, Durgapur Road	7	7

Ticket Fare Analysis:

Case Study: Fare Setting and Revision Policy for Ahmedabad BRTS

In January, 2012 the Government of Gujarat issued directions on maximum and minimum fare setting for the Ahmedabad Janmarg BRTS plying on

areas within Ahmedabad city limits and its surrounding area (Trivedi 2012). The schedule for the base fare is shown in Table 4.2

Table No.2: Janmarg Bus Fare (Trivedi 2012)

DISTANCE (kms)	Bus fares for passengers within city limits(Rs.)
0 – 2	2.00
2 – 4	5.00
4 – 6	6.00
6 – 8	7.00
8 – 10	8.00
10 – 12	11.00
12 – 14	11.00
14 – 16	12.00
16 – 18	12.00
18 – 20	14.00
20 – 22	14.00
22 – 24	15.00
24 – 26	15.00
26 – 28	17.00
28 – 30	17.00
30 – 32	17.00
32 – 34	19.00
34 – 36	19.00
36 – 38	19.00
38 – 40	21.00
40 – 42	20.00
42 – 44	21.00
44 – 46	23.00
46 – 48	23.00
48 – 50	24.00
50 – 52	25.00
52 – 54	25.00

Bus Timetable:

The scheduling of Timetable is the most important in any field. So, the need for timetable of buses is also important. The below table shows the morning schedule starting of Bus timetable.

Table No.4: Schedule of Bus Timetable

Route	Timing
City Bus Stand to Ghugus	6:00 am
City Bus Stand to Mul	6:10 am
City Bus Stand to Warora	6:20 am
City Bus Stand to Rajura	6:00 am
City Bus Stand to Moharli	6:10 am
City Bus Stand to Pathanpura	6:20 am
City Bus Stand to S. T. Workshop	6:30 am

IS & IRC RECOMMENDATIONS

Recommendations for Bus Bays and Bus Shelters

General

The buses shall be allowed to stop for dropping and picking up passengers only at the bus bays. The Government shall indicate in Schedule-C of the Concession Agreement, the number and broad location of bus bays to be provided by the Concessionaire. The bus bays shall confirm to the specifications and standards given in this Section. In cases where bus stands are provided by the concerned State Government Transport Authorities, the Concessionaire shall provide only access road within the right of way.

IV. RESULTS AND DISCUSSION

Results:

From the study parameter and design parameters, the following results are obtained.

1. City buses are the need of the future population.
2. To reduce the pollution created by vehicles in different types such as vehicular pollution and air pollution, the need for CNG bus/fuel is essential for the other bus polluting fuel should be used.

V. CONCLUSION

From the study parameters and design parameters use concluded that.

1. To reduce the traffic :

For reduction of traffic we have studied parking characteristic of our city we found that the major problem and traffic is seen at the Jatpura Gate so the following measure have been taken into account

- Providing roof parking the various points inside City area.
- Providing angle parking at the NH 930 route as the road is getting wide road we can provide parking in that area.

2. To make transportation easier :

For making transportation easier, we have gone through the scheduling of bus timing. When the passenger has to go to Warora Naka from Jatpura Gate, but the bus is stopping at Priyadarshini Hall, so the next bus should come within 5 to 10 minutes of interval. This make transportation easier.

3. To reduce the pollution :

For reduction of pollution, we had implemented CNG gasses which can reduce the pollution percentage instead of using petrol/diesel bus which create more pollution problem.

4. To reduce the cost of transportation:

For reduction of cost we have to provided the CNG busses which is economical the coast of present busses compared with CNG bus/fuel cost in much economical which can reduce the cost for transportation.

Although a conclusion may review the main points of the paper, do not replicate the abstract as the conclusion. A conclusion might elaborate on the importance of the work or suggest applications and extensions. Authors are strongly encouraged not to call out multiple figures or tables in the conclusion—these should be referenced in the body of the paper.

VI. REFERENCES

- [1] Action Plan for Industrial Cluster: Chandrapur, Maharashtra Pollution Control Board, Kalpataru Point, Sion(E), Mumbai. CEPI report Nov 2010, (pg. 28)
- [2] A. P. Singh, (2012) “A Review On Urban Public Transport System Of Bhopal City”, International Journal of Advanced Engineering Technology, Vol.III/ Issue II (pg. 163-167)
- [3] Abhijeet S. Khone, (2016) “A Feasible Traffic Operational System For Complicated Traffic Sites”, International Journal of Science Technology & Engineering, Volume 2 Issue 10, (pg. 669-670)
- [4] Anand Kumar Sharma, (2009) Indore City Bus : A Novel Experiment in Urban Transport, Vol 3, No 2(pg. 15-41)
- [5] “Biogas for Road Vehicles”, (2014) International Renewable Energy Agency.
- [6] C.E.G. Justo & A. Veeraragavan Khanna, Highway Engineering, Classification of Roads & Road Pattern.
- [7] Carlos F. Daganzo, (2010) Public Transportation Systems: Basic Principles of System Design, Operations Planning and Real-Time Control.
- [8] Dr. Shailey Singhal, (2017) “Bio-CNG: A Suitable Choice For Green Transportation”, Akshay Urja
- [9] Ehab Diab, (2015) “Urban Public Transportation Systems: Understanding the Impacts of Service Improvement Strategies on Service Reliability and Passenger’s Perception”.
- [10] Francesco Ciaffi, (2014) “A new Methodology for the Public Transport Network Design”, The 9th International Conference “Environment Engineering” (pg 1-6)
- [11] L. R. Kadiyali, Traffic Engineering and Transport Planning, (pg 635- 760).
- [12] Partha Chakroborty, (2002) “Optimal Route Network Design For Transit Systems Using Genetic Algorithms, Engineering Optimization”, Vol. 34(1) (pg 83-100)

- [13] P.K. Kurian, “Socio- Economic & Environmental Impact of Biogas Programme”
- [14] Rohit R. Galande, (2016) “Comparison of Prior Implementation Studies of BRT Systems of Various Cities in India”, International Journal of Science Technology & Engineering, Volume 2 Issue 09, (pg. 185-191)
- [15] Ruchi Chandrakar, (2016) “Performance of Bus Transit System Planning and Operation for Durg-Bhilai Agglomeration”, International Journal of Science Technology & Engineering, Volume 2 Issue 10, (pg. 1005- 1009)
- [16] Suresh B., (2012) “Bus Stop and Bus Bays In Bangalore: Status Report”. (pg 1- 57)