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SMART MOBILITY BY NAGPUR METRO RAIL THROUGH EFFECTIVE FEEDER BUS SERVICES

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Background

- Increasing urbanisation trends in India is resulting in an increasing travel demand particularly in metropolitan cities.
- Absence of adequate public transport supply is resulting in an increasing motorisation leading to congestion , pollution and safety issues
- Metro system provides a sustainable option of mobility along high traffic dense corridors in large metropolitan cities
- Appropriate feeder transport is vital to ensure sustained ridership levels on metro system in cities
- Hence there is need for planning feeder bus system to enable smart mobility through proposed metro rail system in Nagpur

Objectives of Project

- To review importance of an efficient feeder bus services to metro rail system.
- To explore best practices and identify desired feeder bus service planning and operations norms for case stations.
- To assess the existing transport system and catchment network characteristics around stations i.e Ajani Station, Chhatrapati Station & Jai Prakash Nagar station and the estimated ridership levels.
- To estimate the potential demand for feeder bus services at the case study stations
- To identify potential route network , fleet system and feeder bus services operation plan at case stations.

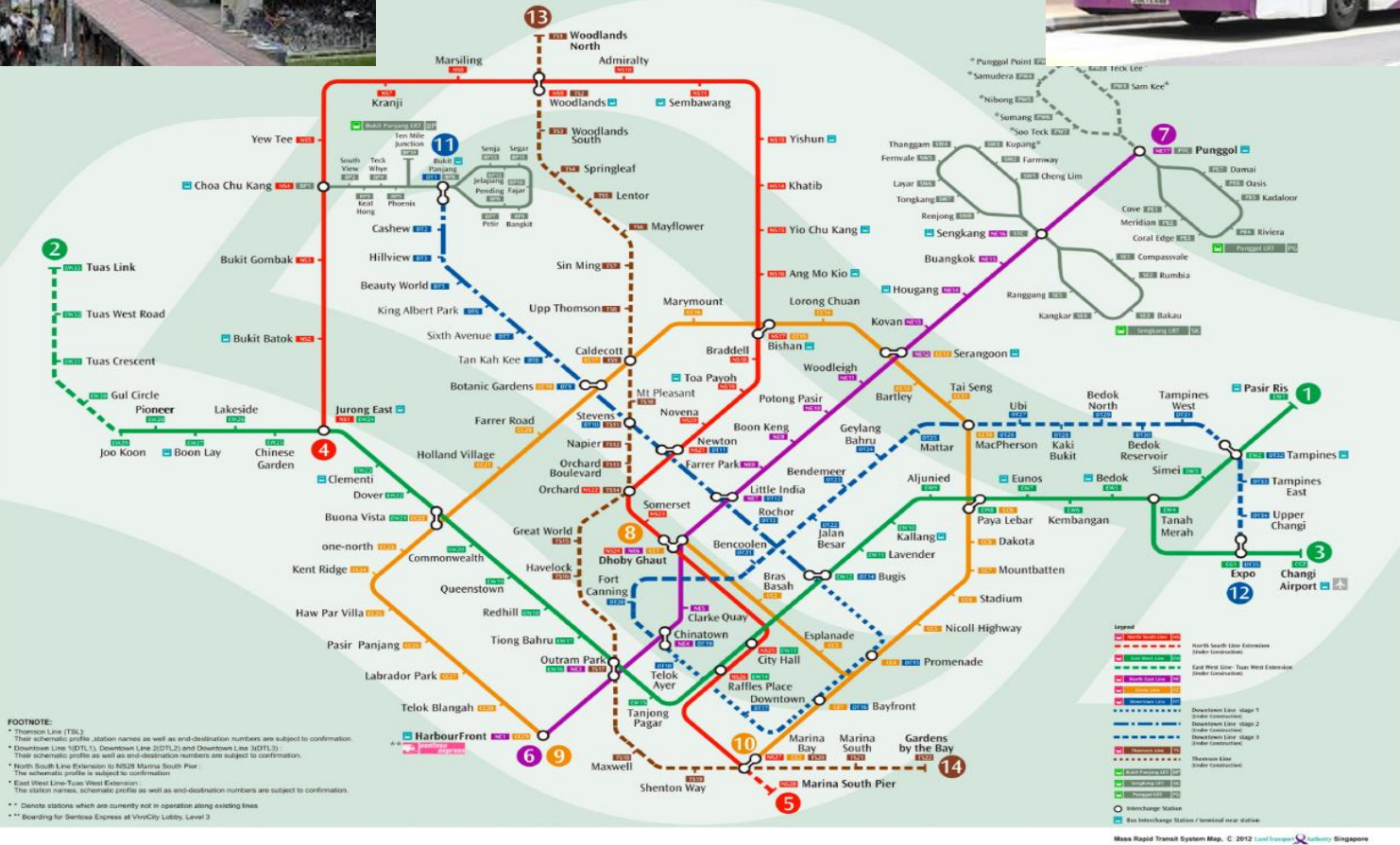
Hong Kong MTR Feeder Bus

Mass Transit Railway Corporation (MTRC) provides feeder bus services for the convenience of passengers using MTR rail networks.

- Feeder bus operates on 17 routes (13 routes includes West Rail Line and Light Rail feeder bus services + 4 East Rail Line feeder routes).
- MTR Bus Fleet comprises 143 buses which provide service for 19 hrs everyday.
- Its integrated fare system also allows East Rail line, West Rail line and Light Rail passengers who use Octopus



Singapore



Routes of **SMRT Buses** (Intra-Town) and **SBS Transit** (Town Link) consist of combined feeder services to provide links between neighbourhoods within the same town, and with the bus interchange and MRT.

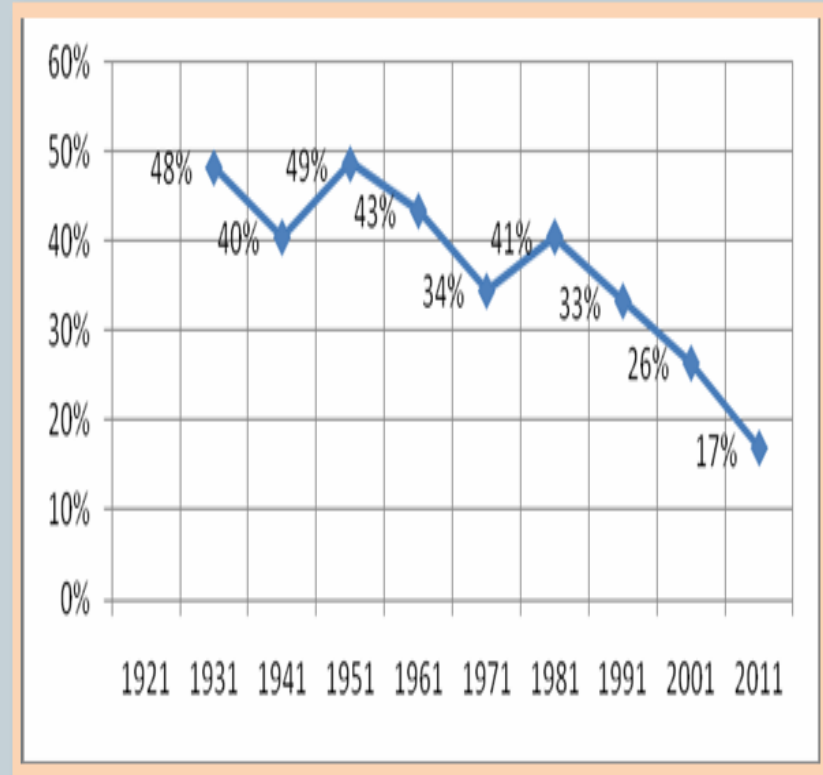


Profile of Case city of Nagpur

- Nagpur is located at the geographical centre of the country.
- Important urban area in the Vidarbha and winter capital of Maharashtra.
- Presence of MIHAN, IT parks and health facilities in Nagpur

Demographical Profile

Decade	Population	Growth Rate
1921	145000	
1931	215000	48%
1941	302000	40%
1951	449000	49%
1961	644000	43%
1971	866000	34%
1981	1217000	41%
1991	1622820	33%
2001	2051320	26%
2011	2398165	17%



Existing Road Network Characteristics

Category of roads	Length in Km
Arterial roads	101
Sub arterial roads	91
Collectors roads	33
Local roads	925
Total length of roads in NMC jurisdiction	1150

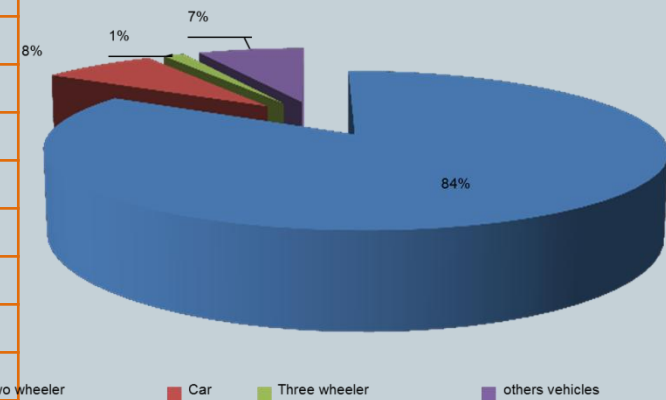
Existing Road Transport System of Nagpur



Motor vehicle Population

Category	31.03.2010	31.03.2011	31.03.2012
Motorcycles	350638	390102	429837
Scooters	271318	293926	318999
Mopeds	283371	283810	283771
Total Two Wheelers	905327	967838	1032607
Motor Cars	79639	89479	99233
Jeeps	26181	28244	29727
Station Wagons	842	842	842
Taxi Cabs	0	0	0
Meter fitted	0	0	0
Tourist cabs	2388	2661	2907
Auto Rickshaws	16058	16417	17149
Stage Carriages	1715	1741	1741
Cont carriages /Minibuses	672	735	899
School Bus	513	575	615
Pvt Service Vehicles	1292	1307	1314

12.37 lakh vehicles in 2012



Salient Features- Nagpur Metro rail project

- Corridor I: North-South Corridor : Automotive Square to KHAPRI
- Corridor II: East West Corridor : Prajapati Nagar to Lokmanya Nagar
- The estimated cost of Project : Rs. 8680 Cr.
- No of Stations : 36
- Max. Permissible Speed : 80 kmph
- Route length : 38.2 km

Metro Alignment Plan

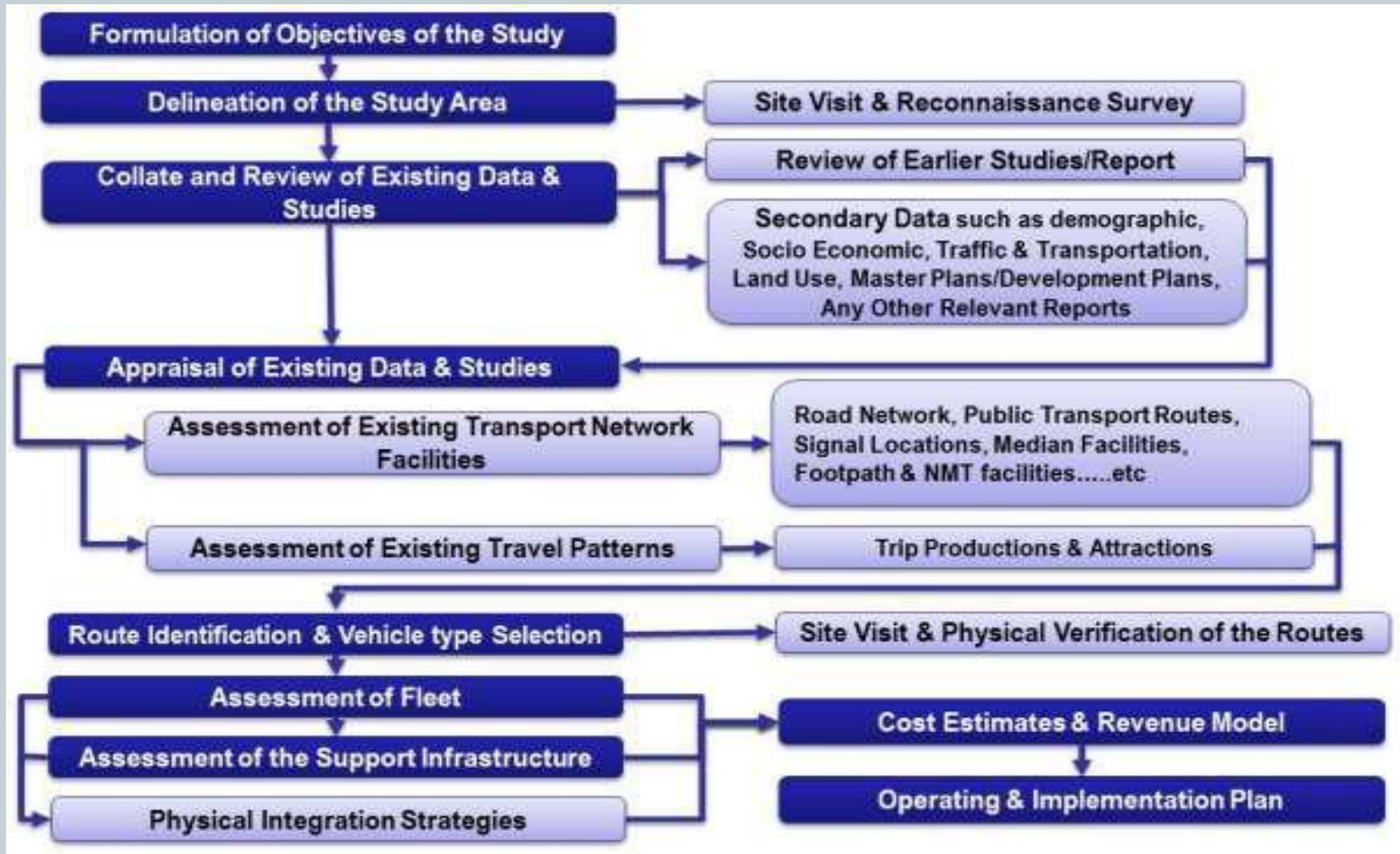
Nagpur Metro Rail Route



Salient Features- Nagpur Metro rail

Alignment	Detail Route
Alignment-1 :- North-South Corridor (19.658 km, 17Stations)	Automotive Square, along Kamptee Road, Wardha Road, Variety Square to Abhyankar Road, along Nag River alignment will fall on Humpyard Road, Rahate Colony Road, Wardha Road, Parallel to Railway Line, Khapri Station
Alignment-2:- East-West Corridor (18.557 KM, 19 Stations)	From Prajapati Nagar, along Central Avenue Road, Railway Feeder Road, Jhansi Rani Chowk, North Ambazari Road, Hingna Road, Lokmanya Nagar

Proposed Methodology

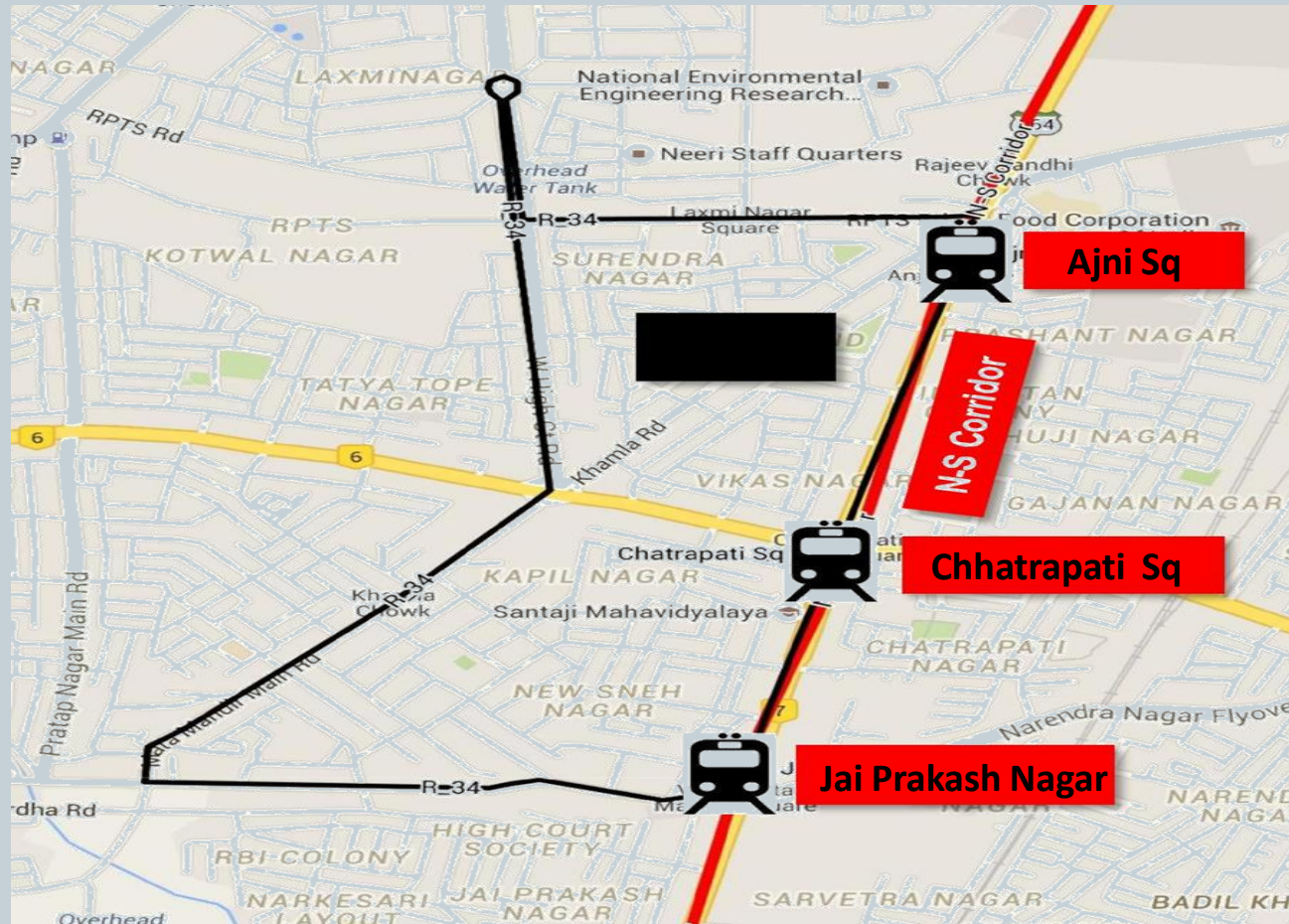


Case Metro Stations Covered

Ajni Station

Chhatrapati Station

Jai Prakash Nagar



BOARDING/RIDERSHIP (DAY)	2016	2021	2026	2031	2036	2041
ON LINE 1(AUTOMATIVE-KHAPRI)	168361	185531	203720	224316	248419	277704

Existing City Bus Services in Nagpur

S. No	Particulars	Details
A	Total Fleet Size	470
B	Effective Fleet	290
I	Fleet Owned by VNIL	
(a)	Standard Bus	150
(b)	Mini Bus	80
II	Fleet purchased under JNNURM	
(a)	Standard Bus	240
(b)	Mini Bus	0

Existing City Bus Services in Nagpur

C	On Road Fleet	228
D	Operational Efficiency	79%
E	No. of routes identified/planned	188
F	Routes Operational	
(a)	Weekdays	44
(b)	Weekends	39
G	Frequency of buses on routes	
(a)	In peak hours	5 to 10mins
(b)	In non-peak hours	15 to 20mins
H	Total no. of passengers (Passengers per day)	1,84,261
I	No. of depots/stations	3
J	No. of terminals	6
K	End points	37
L	No. of bus shelters	75

Criteria for Feeder Route Identification

Characteristics	Criteria Considered for Feeder services
Influence Area	Influence Area – 2.5 kms on either side of the metro corridor
Route Length (kms)	Short Distances (Avg. 4 - 6 kms)
Service Frequency (mins)	Frequency to be in sync with Metro 6 to 13 min The feeder services is planned to connect Economic Activity
Connectivity	Hubs, Commercial Zones and Residential nodes with Metro Stations.
Feeder Stops	At every 300-400 mts. carrying mass from the area near and around Ajni, Chhatrapati, Khamla, Pratap Nagar, Narendra Nagar etc. to the nearest Metro Stations.
Vehicle Type	Energy efficient and environment friendly vehicles to reduce the impact on the environment

Further Work

- Undertake Surveys to identify the choice of potential metro riders in catchment area of case stations
- Assessment of potential demand for feeder bus services at case stations
- Assessment of feeder bus route and service plan for feeder Bus