



## Supporting Sustainable Mobility of **Shared E-Rickshaw in Jabalpur**



By: Sheetal K Upaddhyay  
Deputy CEO, JCTSL Jabalpur

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# Jabalpur Smart City

Jabalpur city is the third largest city of Madhya Pradesh and one of cities of India where the populations is more then a million. It is an important administrative , industrial, education and business centre of MP and India.

## Demographics:

Particulars	Jabalpur City	Jabalpur District
Area	374 km <sup>2</sup>	5,198 km <sup>2</sup>
<b>Population (2011)</b>	1,267,564	<b>2,463,289</b>
Density	478/km <sup>2</sup>	470/km <sup>2</sup>
Sex ratio	929	925
Average literacy rate	82.13%	82.47%
River	Narmada River	

## Economics:

Particulars	Known For
Agriculture	Sorghum, Wheat, Rice and millet ( in villages ) and Pulses, cotton, sugar cane and medicinal crops in commercial crops.
Industry	Garment manufacturing, information technology, education, electrical goods, limestone products, building materials, glassware, telephone parts, furniture, foodstuffs, steel structures, cement, tobacco products, industrial-safety goods
Information technology & Park	Jabalpur has setup an I.T. park (Techno Park) in Bargi Hills having total area of 60 acres. Pay Tm started their operations at Jabalpur in 2018
Armaments	Vehicle Factory Jabalpur, Grey Iron Foundry, Gun Carriage Factor Jabalpur and the Ordinance Factory Khamaria manufactures bullets, howitzers, rockets, bombs, mortars, grenades, shells, trucks, mine-protected vehicles and bulletproof vehicles for the Indian Armed Forces.
Tourism	Marble rocks , bhedaghat water falls , kachnar city , Balancing Rock , Rani Durgawati museum , madan mahal Fort, Dumna Nature Park.

## Transportation:

Mode	No. of trips	% Share (Incl walk)	% Share (Incl walk)
Walk	811292	34.20%	-
Private vehicles	948879	40.00%	60.79%
PT & IPT	602538	25.40%	38.6%
Others	9489	0.40%	0.61%
<b>Total</b>	<b>2372198</b>	<b>100.00%</b>	<b>100.00%</b>

## Purpose of the trips (%):

Area	Work	Busi- ness	Educati on	Shoppi ng	Health /Hospital	Return Home	Other Purpose	Total
Corporation	15.52	3.68	16.20	6.17	1.12	48.4	8.92	100
Cantonment	17.31	3.96	18.00	4.55	0.0	49.6	6.62	100
VFJ/OFK/GCF	20.47	2.55	18.80	4.29	1.12	49.0	3.73	100
Villages	19.36	4.77	21.90	1.31	0.48	49.10	3.1	100
Study Area	16.10	3.68	16.70	5.73	1.04	48.5	8.19	100

## High density corridors / roads with high traffic levels:

Sr.	Route Name	KM	Route Type
1	Railway Station to Bhedaghat	22.3	Trunk Route
2	ISBT to Bhedaghat via Sagra	19.5	Trunk Route
3	Railway station Platform No 6 to Tilwara	13.5	Trunk Route
4	Trimurti Nagar to Gwarighat	11.4	Trunk Route
5	ISBT to Gwarighat	11.9	Trunk Route
6	Karmeta to University	12.5	Trunk Route
7	Panagar to Railway station via Madan Mahal and Teenpatti	22.7	Trunk Route
8	Panagar to Railway station via Ghamapur	18.4	Trunk Route
9	Sur Talai to Ghana (Ranjhi)	29.5	Trunk Route

## IPT Routes:

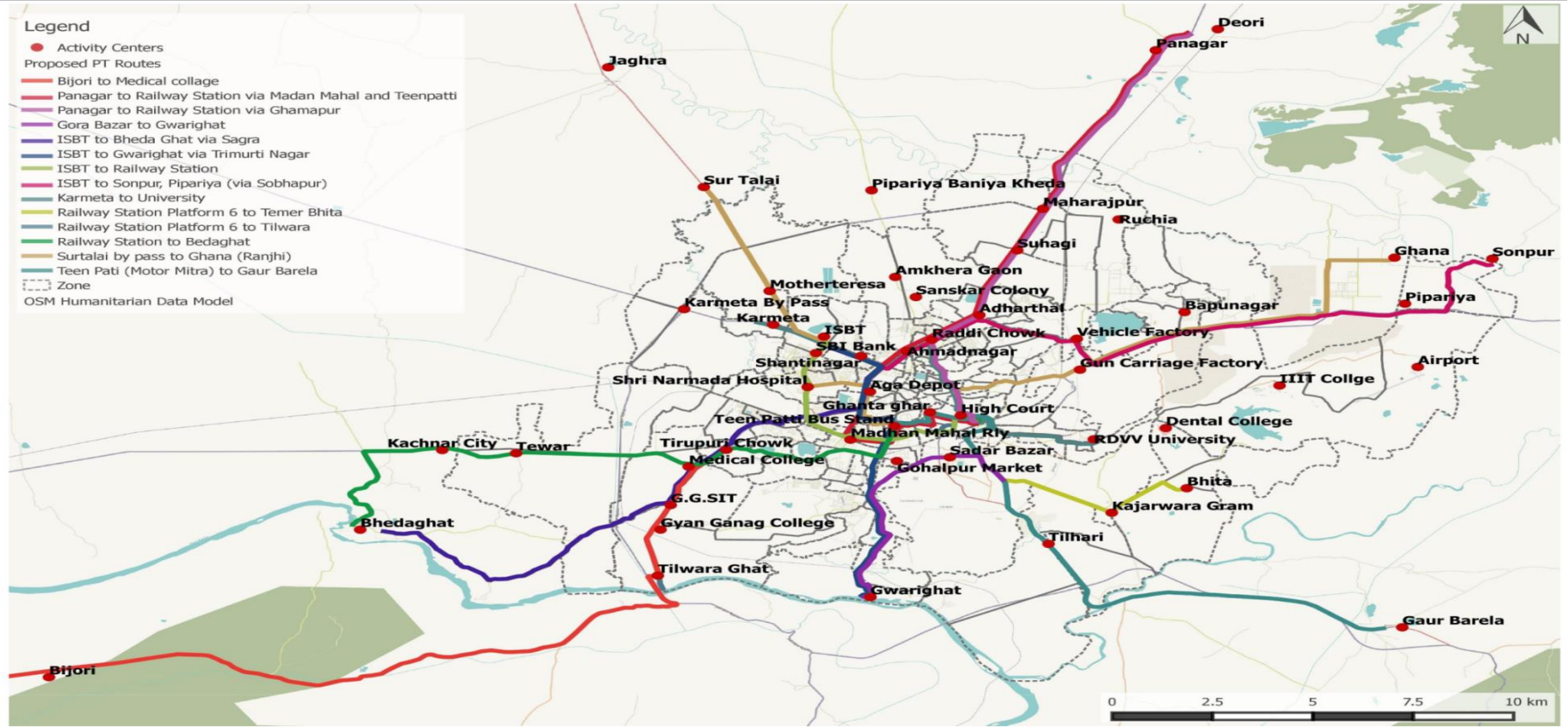
Sr.	IPT Routes	Via
1	Karonda Bypass to Railway Station platform 6	Adhartal, Ghamapur
2	Karonda Bypass to Railway Station platform 6	Adhartal, MadanMahal
3	Ghana Khamaria to Railway Station platform 6	Satpula, Ghamapur
4	Tilhari ekta market to Railway Station platform 1	Gora bazar, Prntinaka
5	Gwarighat to Railway Station platform 6	Teenpatti
6	Tilwara Ghat to Railway Station platform 6	Medical, LIC, Teenpatti
7	Tevar Bhedaghat road to Railway Station platform 6	Medical, LIC, Teenpatti
8	Patan bypass to Railway platform 6	Damoh Naka, Teenpatti
9	Katangi bypass to Railway Station platform 6	Damoh Naka, Teenpatti
10	Auto pre paid booth (1) Railway Station platform 1	Under the JMC Limits
11	Auto pre paid booth (2) Railway Station platform 6	Under the JMC Limits
12	Auto pre paid booth (3) Madan Mahal Railway Station	Under the JMC Limits



## Routes served: PT Routes

Sr.	PT Routes
1	Railway station to Bhedaghat
2	ISBT to Bhedaghat via Sagra
3	Railway station Platform No 6 to Tilwara
4	4A - Trimurti Nagar to Gwarighat 4B - ISBT to Gwarighat
5	Karmeta to University
6	Panagar to Railway station
7	ISBT to Railway station
8	Panagar to Panagar
9	Sur Talai to Ghana (Ranjhi)
10	ISBT to Sonpur, Pipariya
11	Teen Patti (Motor Mitra) to Gaur Barela
12	Railway station Platform No 6 to Bhita
13	Gorabazar to Gwarighat

## Existing Route maps for PT and IPT in Jabalpur



# Objectives of the Project

- Strategy for roll out of e-autos in the city of Jabalpur –
  - *Establishment & enhancement of charging infrastructure (**Solar powered** clean & green energy)*
  - *Getting Subsidy & making project financially feasible*
  - *Finalizing routes, fare & advertisement rights*
  - *Integration mechanism for ICCC & ITMS*
  - *Floating EOI & RFP*
  - *Selection of aggregator*
  - *Operations & Management*

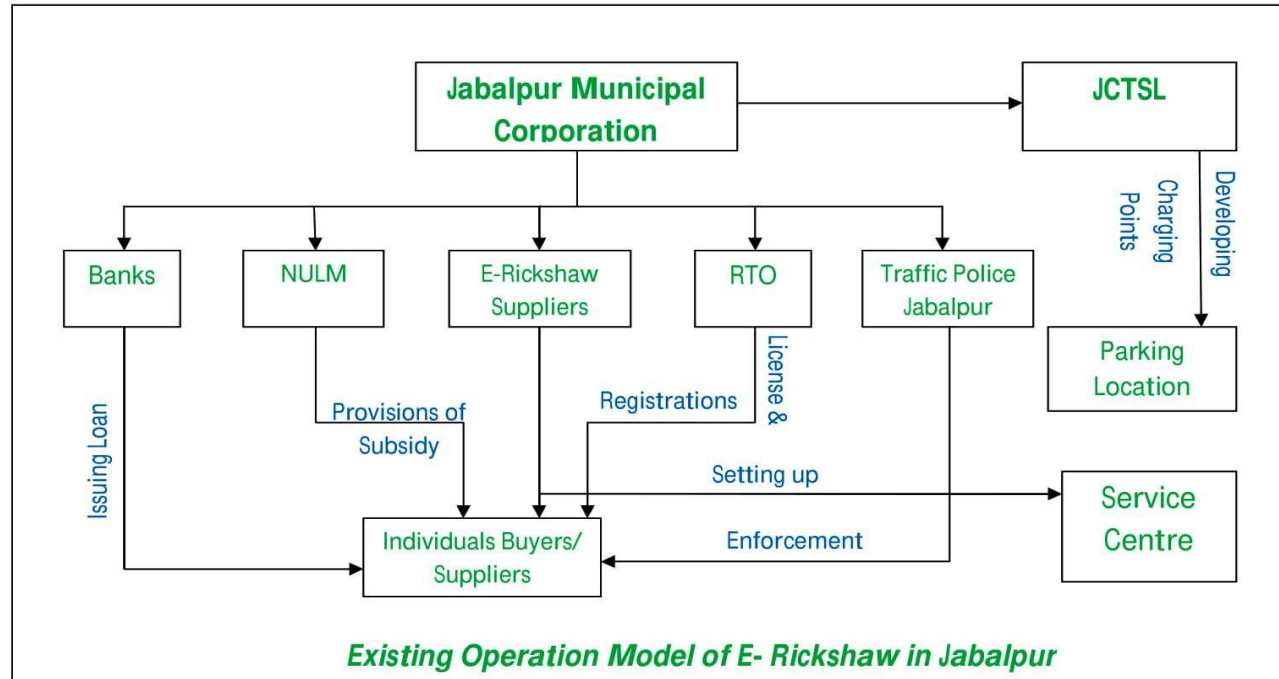
## First Pilot 2017-18

- Started with 25 e rikshaw
- 02 Charging Stations
- Subsidised by NULM
- Financed by banks



# Existing situation of E- rickshaw in Jabalpur

## Operation model being followed



## Existing situation of Public transport and IPT in Jabalpur:

As per instruction by state government the city administration create SPV (Special purpose vehicle) "Jabalpur City Transport Services Limited" JCTSL, a company incorporated under the companies act 1956. JCTSL has been designed to operate & manage the public transport system in Jabalpur city.

Public Transport	No. PT Vehicles	Daily Commuters
City Buses	119	~ 50000
Airport Shuttle	2	80-90

IPT	No. of IPT Vehicles	Daily Commuters
Auto	10500	~ 360000
E-Rickshaw	600	~ 80000
Cycle Rickshaw	2000	~ 20000

## Electric Three Wheelers in Jabalpur – Facts & Figures:

1	Daily Rental paid	Rs. 200 - 300 per day (initially Rs. 150 per day)
2	Maintenance	Self
3	Daily Income per auto	Rs. 500-1000 per day (Self-Owned E-rickshaw)
4	Fare Charged (up to 2 km trip only)	Rs. 10 - Shared basis Rs. 30 – Private hire
5	Charging Location	ISBT Jabalpur, Damoh Naka
6	Charger type	2 kw charger operating on 230-240 V mains supply
7	Charging Time	8-10 hours for full charge, 2 hr min for top up.
8	Hours of operation	6 am to 10 pm
9	Parking at night	At the metro station parking area
10	Capital Cost of Auto in open Market	Around Rs. 2,00,000 on road price
11	Auto Type	Fixed Battery of 4 kwh, 4 seater, two speed operation



## Next Milestone achieved 2019

- 07 new Parking cum Charging stations
- Increases charging points
- On site survey, Identified issues
- 19 feeder Routes finalized
- Organised Awareness camps, Training sessions
- Proposed 20 additional charging stations including or 2W, 3W & 4w



# On Site Survey

Suraj Prasad Mishra

## QUESTIONNAIRE

Survey form no. 08

Survey Date: Survey Time: 05/10/2019 1:15 P

1. Key issues in the existing procurement system of Ex Battery charging time
2. Key issues in Operation of E-rickshaw Battery Built up
3. Key issues in maintenance of E-Rickshaw Parts are not readily available.
4. Have you heard of E-Auto? Will you prefer to operate E-auto over the conventional auto? yes
5. Which model of the following will you prefer for operating E-auto?
  - (1) Upfront assistance model: Down payment of Rs. 25,000 and charging facility will be provided by the authority.
  - (2) Rent Model: The E-auto drivers will pay rent per day, if rent model is preferred, how much rent are you ready to pay?

Auto Details				Routes: (write major destinations covered)	
Registration No.:	MP26R7485	Earning per day:	Rs. 700/-	Gandhi Chowk to Dm Bazar 5:00 P	
Ownership: Self / Rented ✓		Cost per day: 500/-			
If self-owned,		Maintenance cost	Rs.		
Cost of auto:	Rs.	Any other:	Rs.		
If rented,		Range in single Charge	Rs. 60-70 km	(After 10:00 AM)	
Rental per day:	Rs. 350/-	Total Kilometers traveled per day:	70-80		
Residence of Driver (area)		Total passengers carried per day:			

Battery type - Lead Acid.  
charging time - 6h-8h.

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Suraj Prasad Mishra

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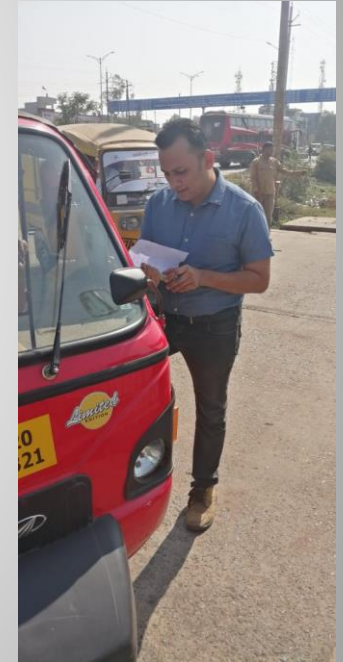
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## Meetings / Discussions



## Rooftop solar powered Charging Infrastructure



**Valuable inputs from e-rikshaw drivers**

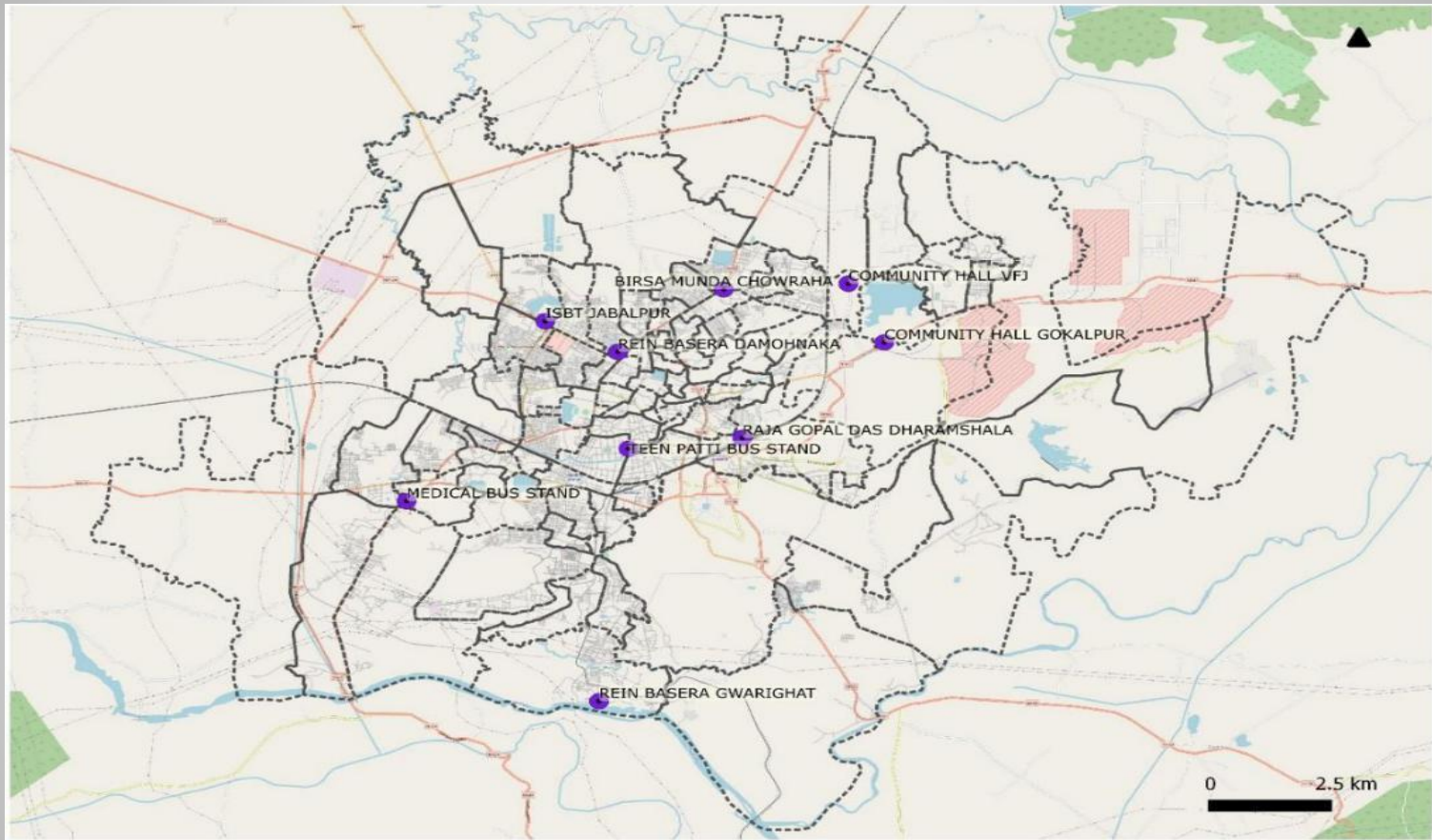
## Proposed IPT (EV) feeder routes in Jabalpur:

Sr. No.	IPT (EV) Route Name	Route Type	Length in KM
1	Damoh Road to Green City Road via Madho Talab	IPT Feeder	3.2
2	Darshan Tiraha to Bada Patthar Area	IPT Feeder	3.2
3	Dhanwantari nagar rto sai Colony near Bukamp colony	IPT Feeder	5.3
4	Ganga Nagar loop via Chandan colony	IPT Feeder	3.0
5	Gohlpur to New Shobhapur Colony via Hanuman Tal	IPT Feeder	5.7
6	MPEB to Madan Mahal	IPT Feeder	5.0
7	Panda ki Madiya to Madan Mahal Station	IPT Feeder	4.0
8	Patan Bypass to Sontalai	IPT Feeder	7.0
9	Pipariya to Amjhar	IPT Feeder	7.2
10	Rampur Chowk to Brajmohan Nagar	IPT Feeder	3.2
11	Rampur Chowk to Tilwara Road via MPSEB Colony	IPT Feeder	6.3

Sr. no.	IPT (EV) Route Name	Route Type	Length in KM
12	Ranji Tiraha to Suhagi via Vehicle Factory Estate	IPT Feeder	6.8
13	Sanjeevani Nagar to Hathital	IPT Feeder	4.0
14	Surtalai to Jhagra via Belkhadu	IPT Feeder	7.3
15	Shahid Smarak Loop	IPT Feeder	3.4
16	Shiv Nagar to Kura Road via Lamti	IPT Feeder	5.0
17	Teen Patti to Amkera Gaon Junction	IPT Feeder	5.0
18	Tilhari (Pink city Town) to Kajarwara Gram	IPT Feeder	3.4
19	Tilhari Xidas to Gwarighat	IPT Feeder	6.6

These locations experience service gap in public transport network. Introduction of E-autos in these areas will fill the gap by operating as feeder service. Further, the above locations were Picked up by JCTSL.





Existing Electric Vehicle Charging points in Jabalpur city

## E- rickshaw Deployment Plan

Finding aggregator on PPP, VGF or Subsidised model on following –

- Lithium Ion Batteries
- Swapping model
- App based booking model
- Live tracking
- Integration with existing PT system
- Proper maintenance mechanism

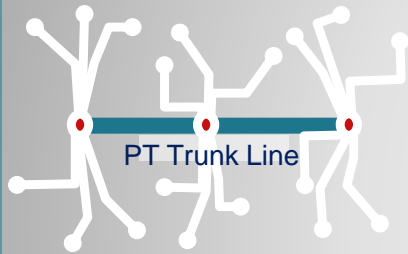
## Suggested Business Model – Role of Stakeholders

Stakeholder	Roles
Jabalpur Municipal Corporation & JCTSL	<ul style="list-style-type: none"><li>• Engaging the stakeholders such as the RTO, traffic police etc.</li><li>• Providing clear land for charging and parking infrastructure.</li><li>• Supporting for any civic infrastructure like signage and queuing space.</li></ul>
Aggregator	<ul style="list-style-type: none"><li>• Tying up with banks for a loan</li><li>• Purchasing and ownership of E autos and RTO registration</li><li>• Tying up with app/ITS service provider</li><li>• Identification of auto drivers for deployment of autos on salary/rental basis.</li><li>• Ensuring operationalization of E autos on selected routes</li><li>• Providing tech support for major maintenance of the E autos</li><li>• Maintaining a charging and parking infrastructure on land provided by JCTSL.</li></ul>

Stakeholder	Roles
JCTSL	<ul style="list-style-type: none"> <li>• Motivating Replacement of petrol / diesel vehicles to e-auto / rikshaw</li> <li>• Providing VGF for financial feasibility</li> <li>• Funding the subsidy assistance via JMC / Govt.</li> <li>• Advancement of the charging infrastructure</li> <li>• Preparing up scaling plan for introducing new E autos</li> <li>• Initiate branding and communication strategies</li> <li>• Monitoring and enforcement (ICCC &amp; ITMS)</li> </ul>
E-Auto and Charging infrastructure	<ul style="list-style-type: none"> <li>• Establish charging infrastructure at given locations and handing over to Aggregator</li> <li>• Establishing service centres and supply spare parts in the city.</li> <li>• Introducing battery swapping models</li> </ul>
Bank	<ul style="list-style-type: none"> <li>• Issuing of loans at competitive negotiated bulk rate</li> </ul>
Beneficiary/E-Auto operator	<ul style="list-style-type: none"> <li>• Rent/hire E auto from Aggregator and operate at prescribed fares on broadly identified routes.</li> <li>• Day to day maintenance of vehicles.</li> </ul>



## Service Type:



### Feeder

Services as feeder to transit nodes such as railway station, bus station, Railway station. Charging points are placed at the main transit node.



### Loop

Services in fixed loops and can also operate under shared arrangement.. Charging points are placed at one or two places on the loop



### Point to Point

A service joining two specific, high frequency points. Charging station may be placed at both locations



### Corridor

A corridor over a major trunk route can be developed. Charging stations can be placed at regular distance intervals of 3-5 km. It can facilitate long distance transit role for e autos.

## Battery disposal and Exchange schemes for old autos:

- Proper disposal of batteries.
- This must be clarified with the vehicle OEM and battery OEM at the time of purchase.
- Discount should be offered for exchanging the old battery with a new one.
- OEMs to follow regulations similar to The Battery (Management and Handling) Rules, 2001 (for Lead Acid Batteries) are notified by the Central Government
- Trying to replace existing lead acid battery to Lithium ion battery



## Way Forward and Time lines

Sr.no.	Tasks	Tentative Dates
1.	Finalization and approval of EOI	Dec-Jan 2019
2	Establishing proposed charging infrastructure by OEM and JCTSL	Jan 2020
3.	Floating RPF for Aggregators	Feb-March 2020
4.	ICCC & ITMS Integration	May 2020
5.	E Auto / Rikshaw operations to begin and monitoring	June - July 2020

# Thank You