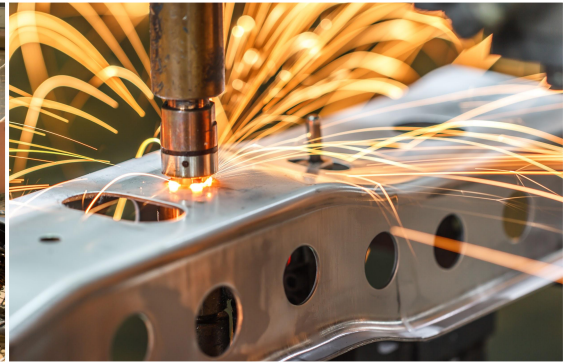
The Promise of Shared, Connected, and Electric Mobility for India

OLA MOBILITY INSTITUTE

January 2020

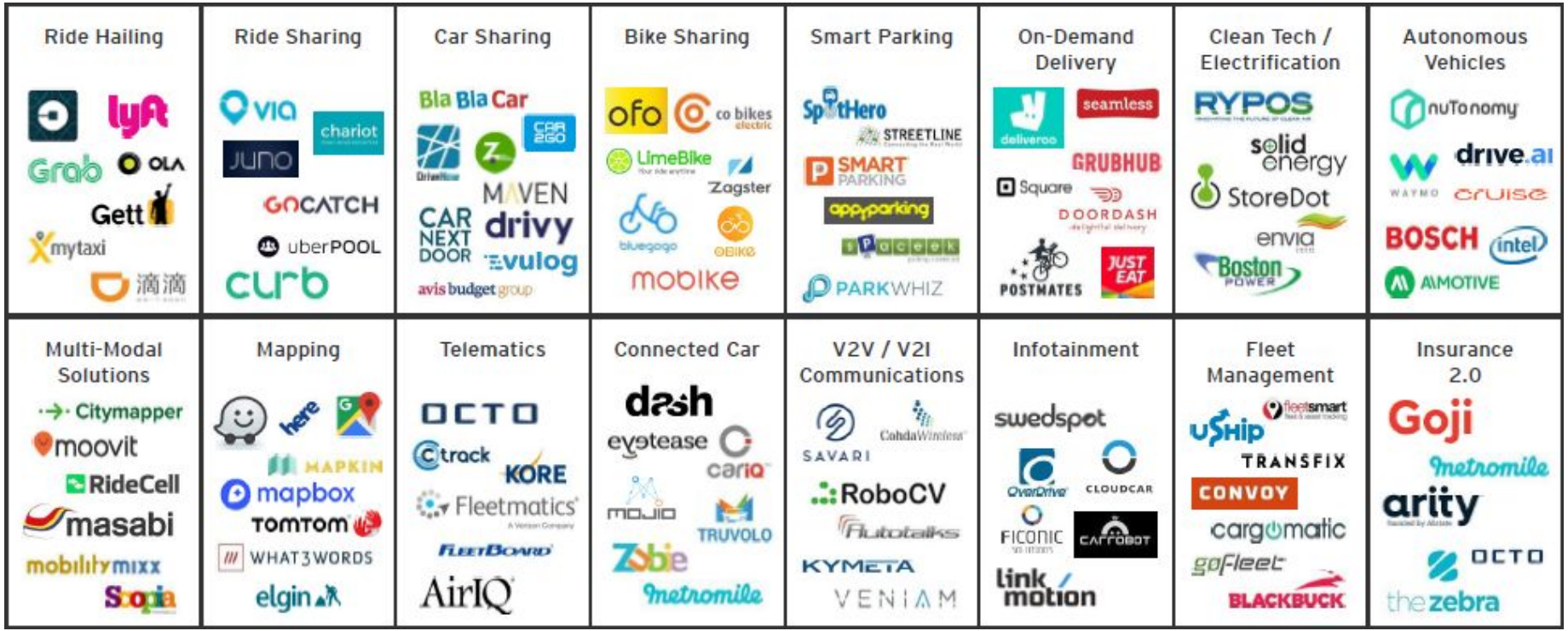





Agenda

- ➔ Capturing the Changing Mobility Ethos
  - ◆ Global Trends
  - ◆ India Scenario
- ➔ India's Mobility Opportunity: Shared, Connected, and Electric
  - ◆ Issues Getting Addressed
  - ◆ Growth of Mobility Startups
  - ◆ Creation of the Mobility Economy
- ➔ The Future of Mobility

Capturing the Changing Mobility Ethos: Global Trends



Source: EY, Electric vehicles EV - global scenario

Risk Capital Investment in Mobility: **$60 B**

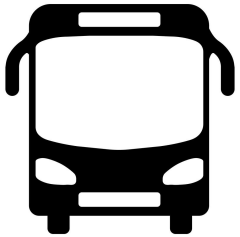
On-demand Mobility Unicorns are **15** in number globally!

World's Leading Unicorns are **mobility companies!**

Source: CB Insights

Traditional Mobility Choices

Choices



Traditional Mobility service providers			
	Automaker Autodealer	Governments Cities	Independent businesses / owners

FORCES OF CHANGE		Temporal Flexibility	
		Fixed Schedule	Demand responsive
Spatial Flexibility	Fixed route	Rail Tram Bus Minibus	Shared Taxi
	Variable route	Contract carriage Private Taxi	Private cars Public cars Taxis Autos Cycle rickshaws E-rickshaws

Easy availability of data

New vehicle ownership concept

Regulatory push to reduce vehicular emissions

"Don't assume we're always going to be in the car business...The notion is you don't have to have ownership of a vehicle, you just want to get from point A to point B."

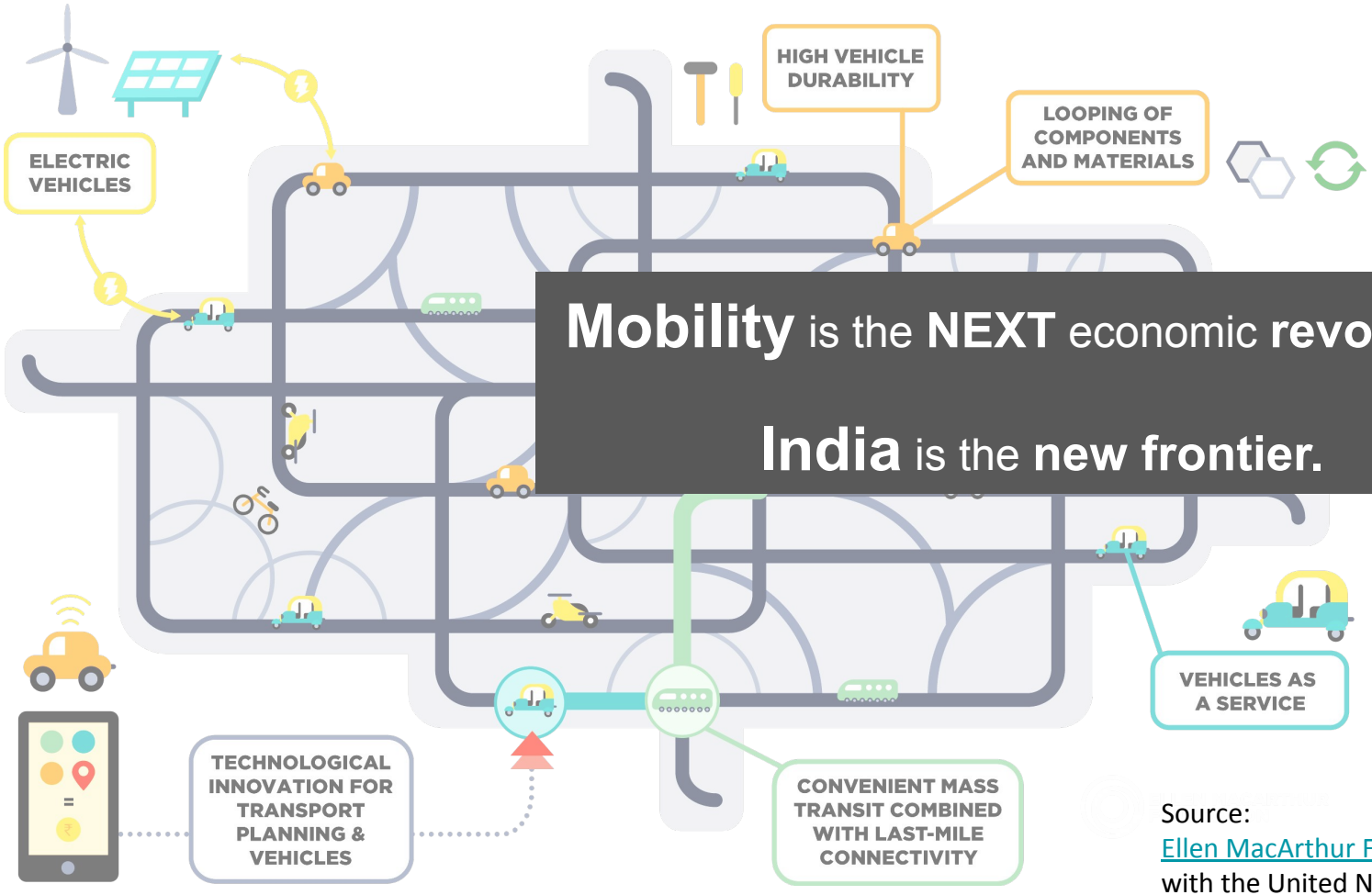
Chairman, global volume vehicle manufacturer

1. **Real Estate / Shared spaces** — Inhabiting spaces without buying them. E.g. OYO Living, Zolostays
2. **Media streaming companies** — Watching content, without downloading /owning it. E.g. Netflix, Hulu
3. **Goods and Services providers** — Accessing without buying. E.g. Rentomojo, Flyrobe
4. **Mobility service providers**

Profit pools for the automotive industry

Source: SCI

Capturing the Changing Mobility Ethos: India Scenario



Mobility is the **NEXT** economic **revolution**!

India is the **new frontier.**

Source:
Ellen MacArthur Foundation
with the United Nations

Passenger Vehicle Density is LOW

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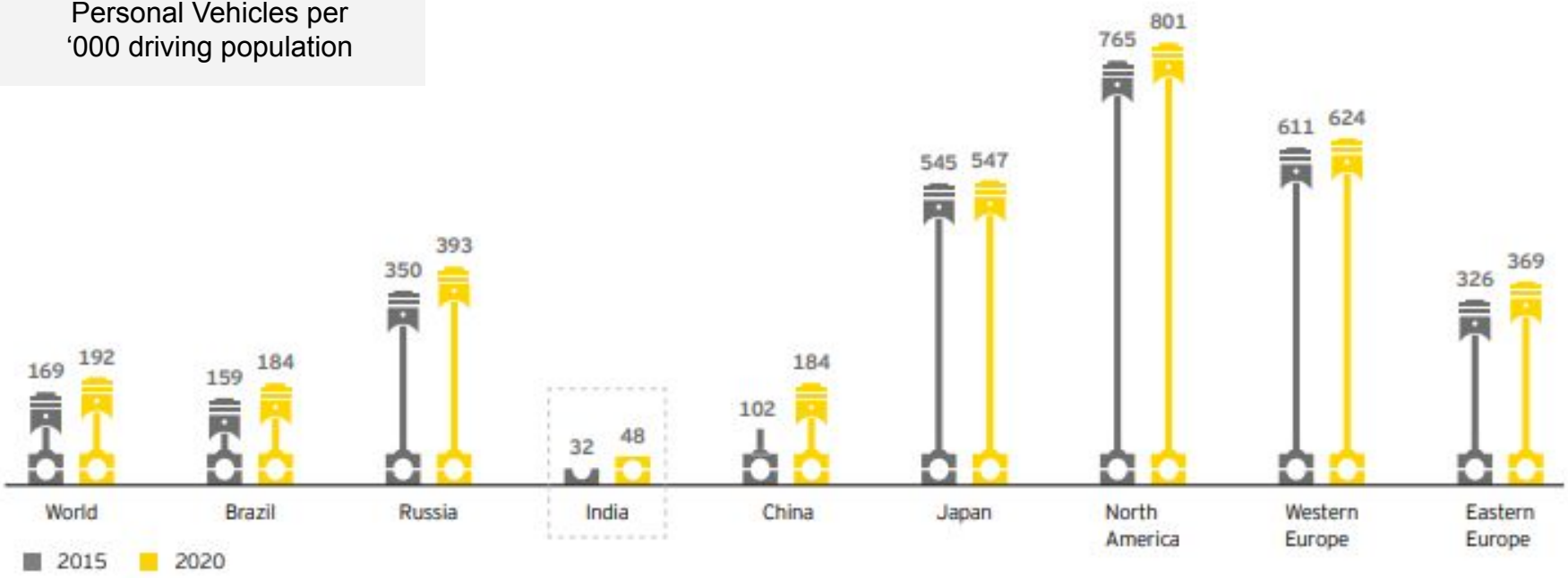
Personal Vehicles per
‘000 driving population



Source : EY

Shared Mobility: How India commutes today

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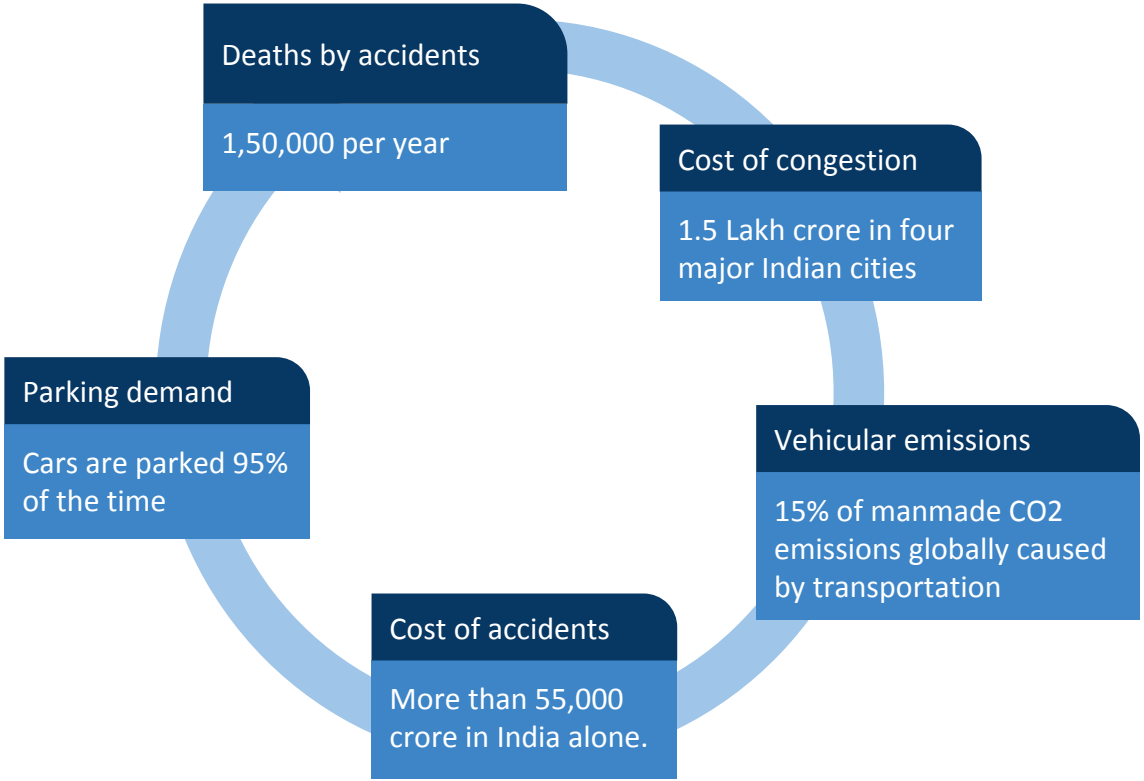
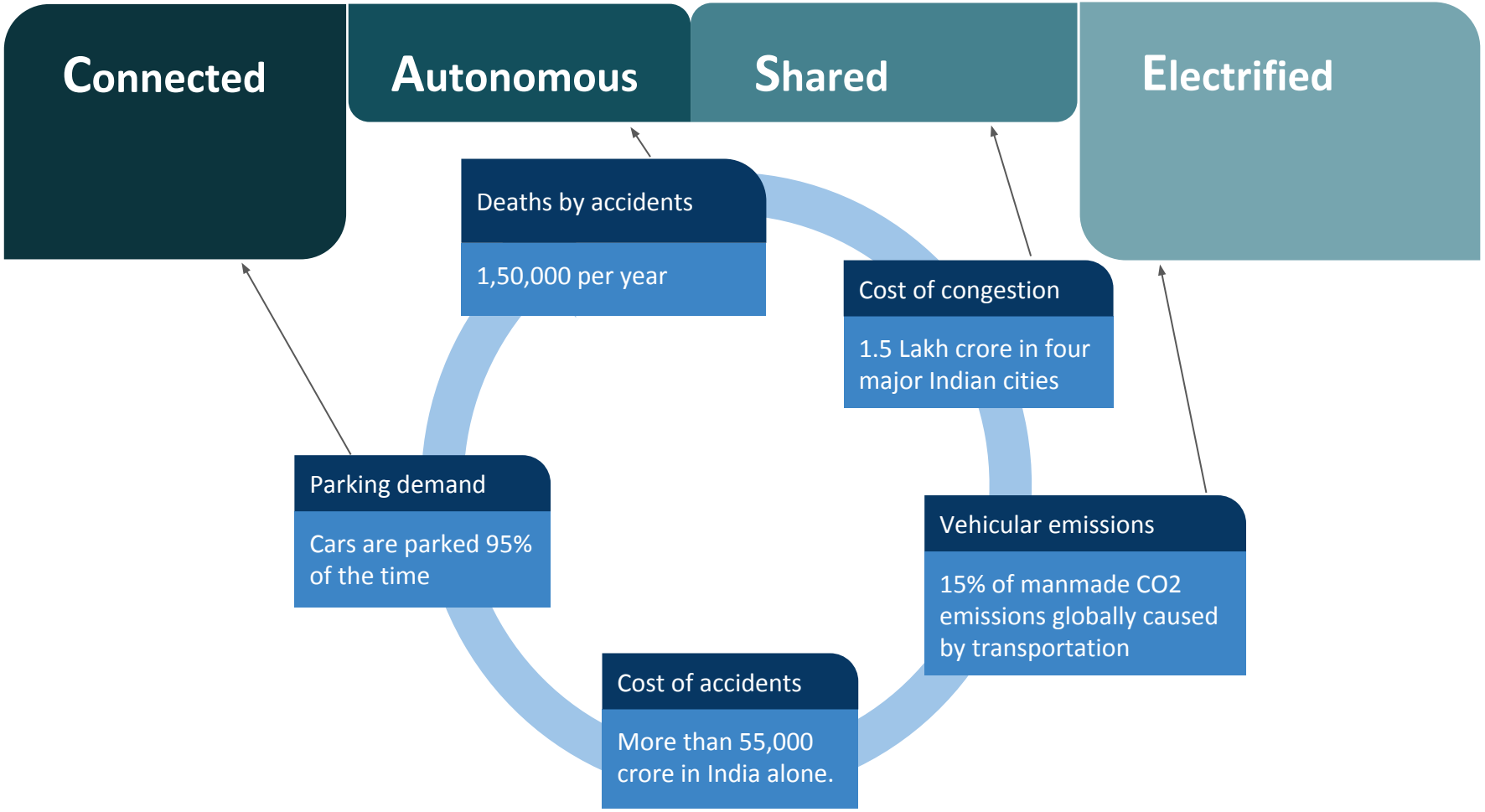
Shared mobility is highly utilised in India. Public Transport, including taxi-cabs and autos, and non-motorised transport, account for 55% of all trips in the country. With low car-ownership too, India is positioned well for a mobility transformation.

Source: DownToEarth

India’s Present Challenges

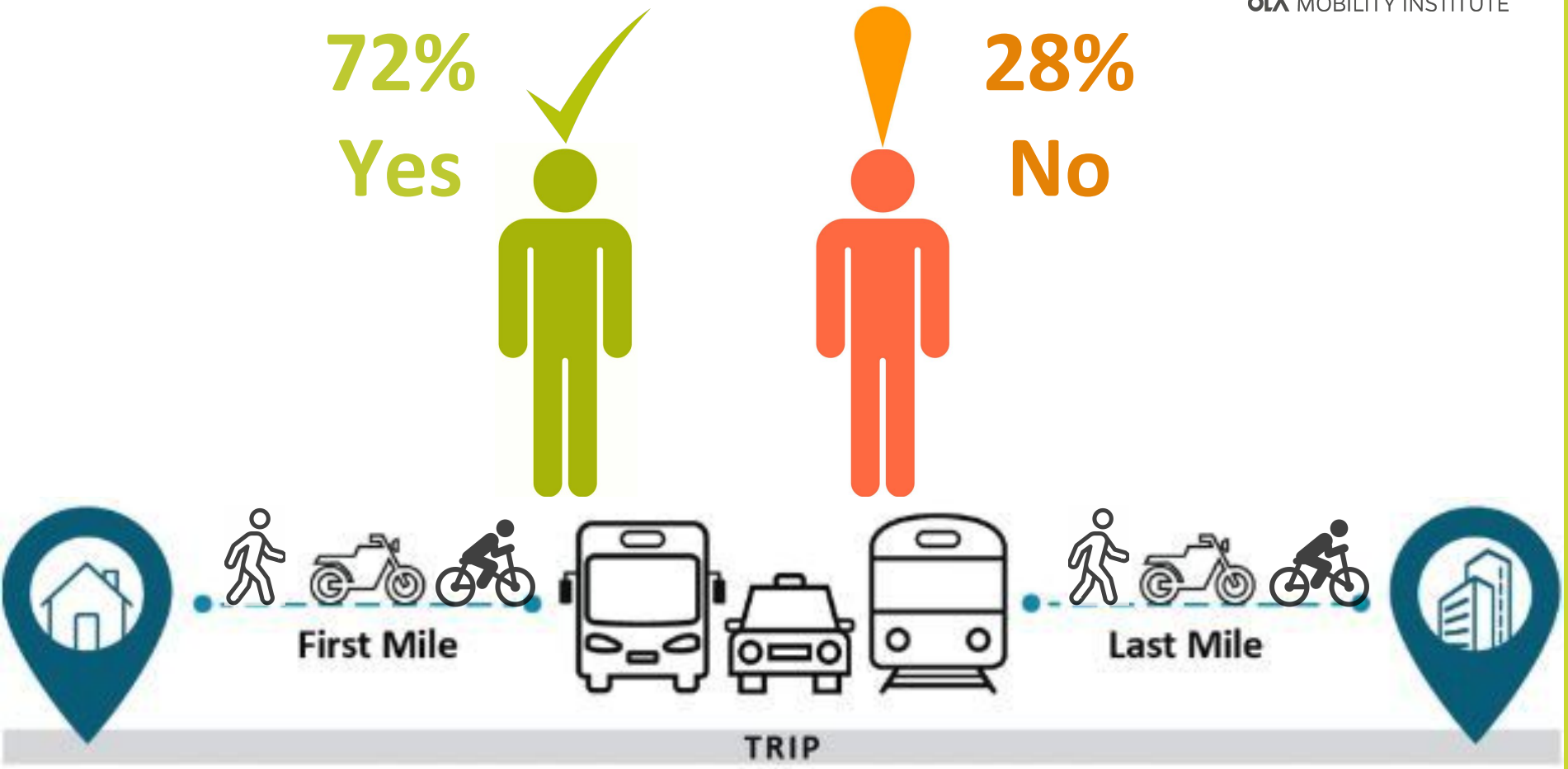



Connected
Autonomous
Shared
Electrified
Deaths by accidents
1,50,000 per year
Cost of congestion
1.5 Lakh crore in four major Indian cities
Vehicular emissions
15% of manmade CO2 emissions globally caused by transportation
Cost of accidents
More than 55,000 crore in India alone.
Parking demand
Cars are parked 95% of the time

Improve first and last mile connectivity

72%
Yes

28%
No



CITY SELECTION

DIVERSE SCALE

DIVERSE GEOGRAPHY

DIVERSE CULTURE

DIVERSE CHARACTER

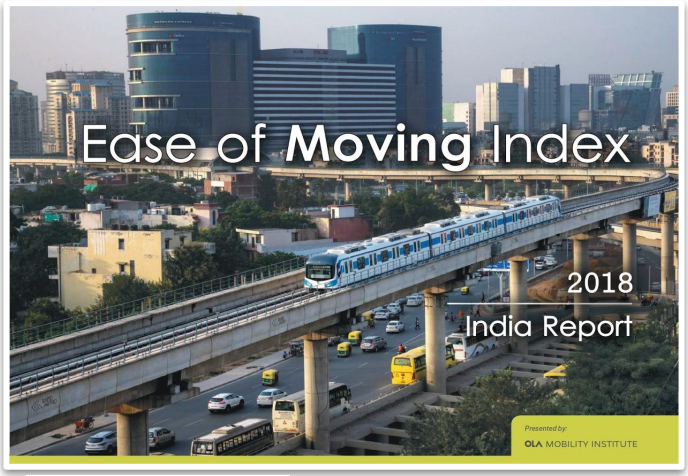
DIVERSE ECONOMY

43,500 survey respondents

20 cities
92 million residents

- **6 Metro Cities**: Population > 7 Million
- **7 Booming Cities**: Population 2 Million – 7 Million
- **7 Promising Cities**: Population < 2 Million

Ease of Moving Index (November 2018)



THE HINDU

The NEWS Minute

live mint

business today

TOI

"I congratulate OMI for this initiative. I hope this Index is adopted by stakeholders to understand mobility requirements and plan accordingly." - Nitin Gadkari

"This is a much needed Index for India, we would be happy to partner to further develop this Index." - World Bank

"The report fills an important gap of benchmarking mobility in cities." - Rocky Mountain Institute

Shared Mobility in India

Micro-mobility and Shared Mobility Options

Public Bicycle Sharing

Bike

Auto

Micro

Mini

Share

E-rickshaw

Prime

Outstation

Rentals

LUX

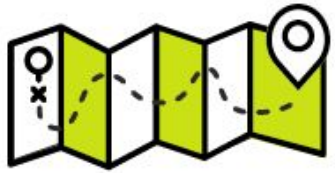
Shuttle

Ola - One of the world's largest ride-hailing companies

2 Million
Driver - Partners

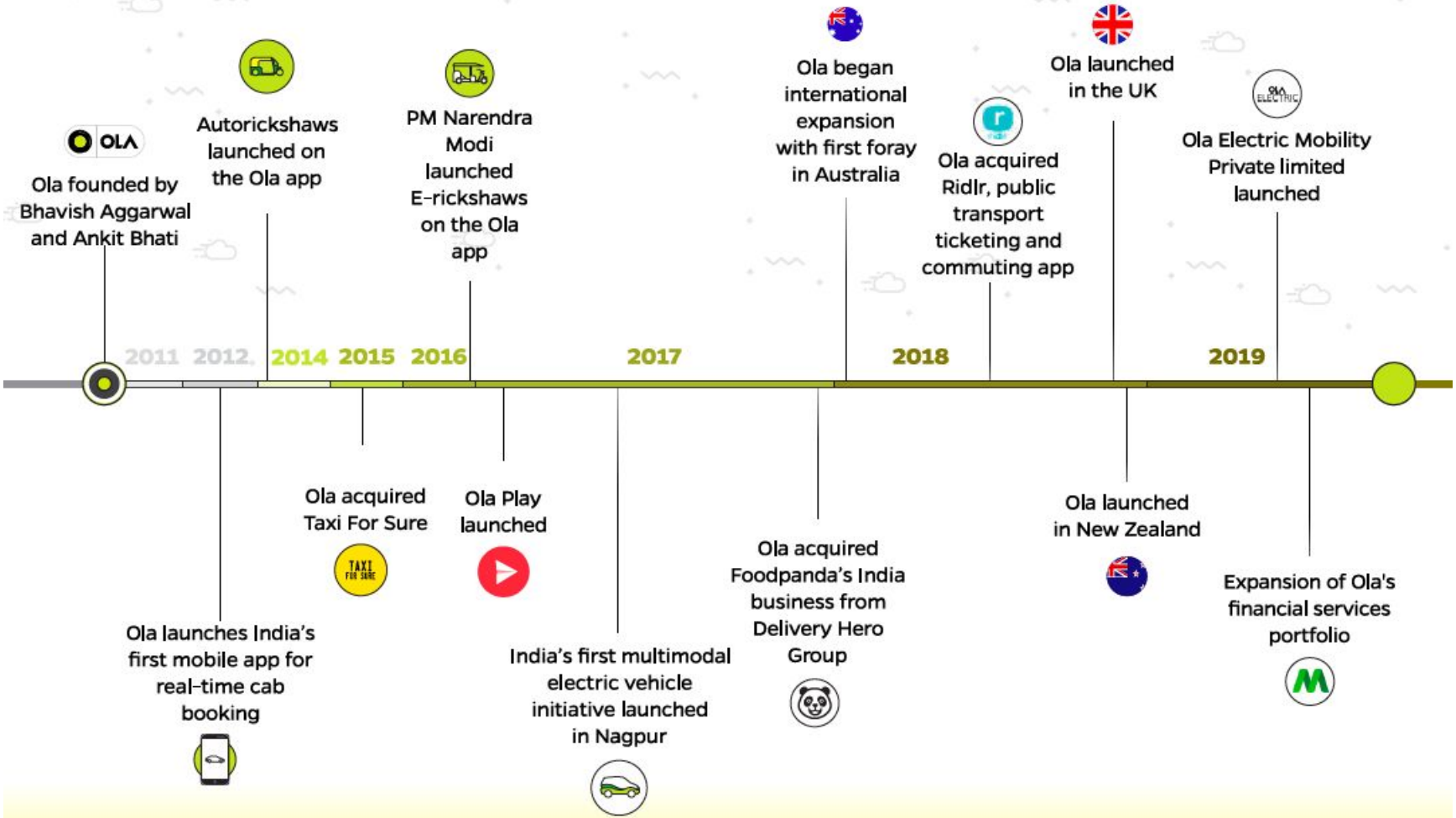
7,000+
Employees

4 Countries
250+ Cities



1 Billion
Rides Annually

Ola, India's Mobility Unicorn



Driver initiatives

Comprehensive in-trip insurance

Partner mobile app available in 9 Indian languages

24X7 walk-ins and partner care

Ola partner world

Ola operator app

Customer initiatives

- 'Ola Guardian' Real-Time Customer Ride Monitoring System launched
- Offline booking option for low connectivity areas
- Ola select, premium loyalty program offering a range of benefits
- Auto connect WiFi offers internet connectivity on the move
- Progressive web app offers an app-like experience on simple smartphones
- Share pass enables Ola Share rides at flat rates
- 2G optimization to enable seamless booking experience
- Multiple payment options like Ola Money, Ola Money Postpaid, UPI
- Ola pass enables discounted fares on daily commute
- Comprehensive in-trip insurance

Benefits of Shared Mobility

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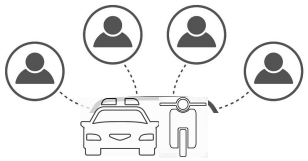
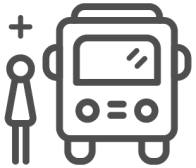


Maximises Asset Utilisation and Services

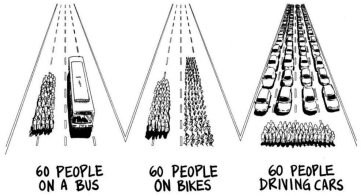


Reinvents public transport

Improves decision-making and fosters innovation

Reduces emissions

Champions electrification and clean mobility



Decongests cities

Promotes Entrepreneurship

Source : NITI Aayog

Ola Share from
Mid-2015 to Jan. 2019

Saved over
37 million (3.7 crore)
litres of
import-dependent
fossil fuel

Reduced CO2
emissions by over
63 million (6.3
crore) kgs

By 2030, India's **new mobility market** would be worth

USD **90 billion**

- Traditional vehicle sharing
- P2P vehicle sharing
- Corporate sharing
- Dynamic shuttle
- Mobility as a service
- Taxi services

Source : Frost and Sullivan

Why does e-mobility matter?

Why does e-mobility matter?

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Promotes
Energy Security

Promotes renewable energy production and integration

Augments Skills and Jobs

Changes the global automobile and energy landscape

Reduces Emissions; Increases Clean km

Spurs innovation in local R&D and Manufacturing

Promotes Entrepreneurship

Is there evidence?

India’s first multimodal pilot

Charging Station Location	Connected load (in kWh)	Number of Chargers
Airport	150	4 fast and 4 slow
IOCL fuel station	30	2 fast and 2 slow
Nandanvan	150	5 fast and 5 slow

India’s first multimodal pilot

Mahindra e2o Plus
Hatchback

Battery capacity:
15 kWh Advanced
Lithium ion battery

Practical Range
~100 km

Average Daily Run
142 km

Charging Time Slow:
7-8 hrs
Fast: 1.5 - 2 hrs

In peak summer, the battery pack consumes 50% more units to reach full charge.

Kinetic Safar
E-Rickshaw

Kerb Weight
295 kg

Battery Capacity
2.8 kWh

Top speed
25 kmph

Passenger
Capacity
4

Average Daily
Run
66 km

Practical Range
in full charge
35 km

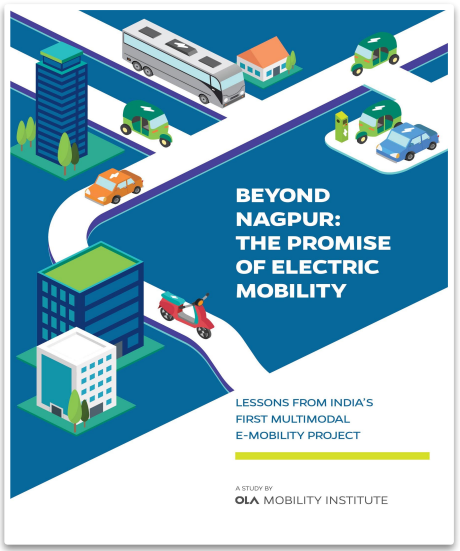
Served over
3,50,000
customers

Clocked over
75 lakh
clean km

Saved over
5.7 lakh litres of
import-dependent
fossil fuel

Reduced CO2
emission by over
1,230 tons

Beyond Nagpur (April 2019)



TOI

Business Standard

live mint

QUARTZ
qz.com

PTI

The Economic Times

"Solid set of recommendations"
-Brookings India

"Very nice and comprehensive report on your experience and clear recommendations"
- ARAI

"Excellent work, thanks for sharing! Please start in Kerala, we will facilitate"
- PS Transport, Kerala

"This is very interesting and something that will be of great importance to London as well"
- London & Partners

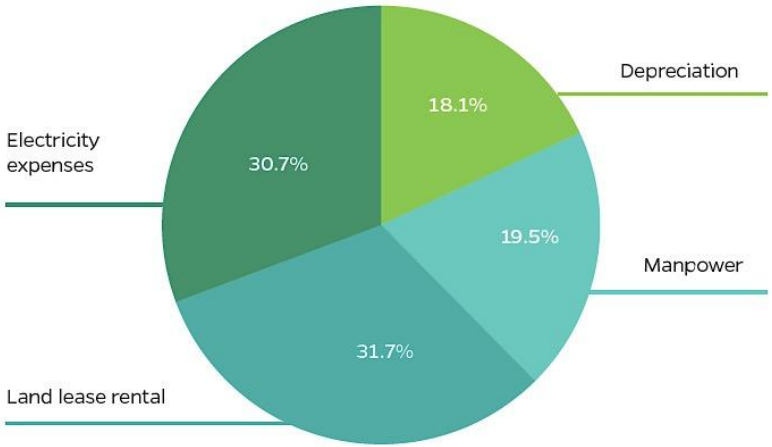
Charging Infra Operating Costs

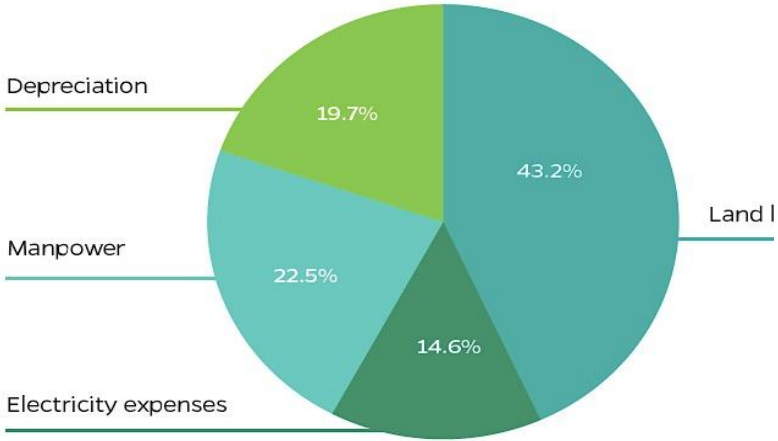
Land lease rentals at INR 23-28 per sq. feet, high electricity expense (charged at commercial tariff of INR 17.7 per kWh from May 2017 to Sep. 2018, and INR 8.01 per kWh from Oct. 2018 onwards as special EV tariff, coupled with manpower expenses and depreciation kept the operating expenses high.

May 2017 – Sep. 2018

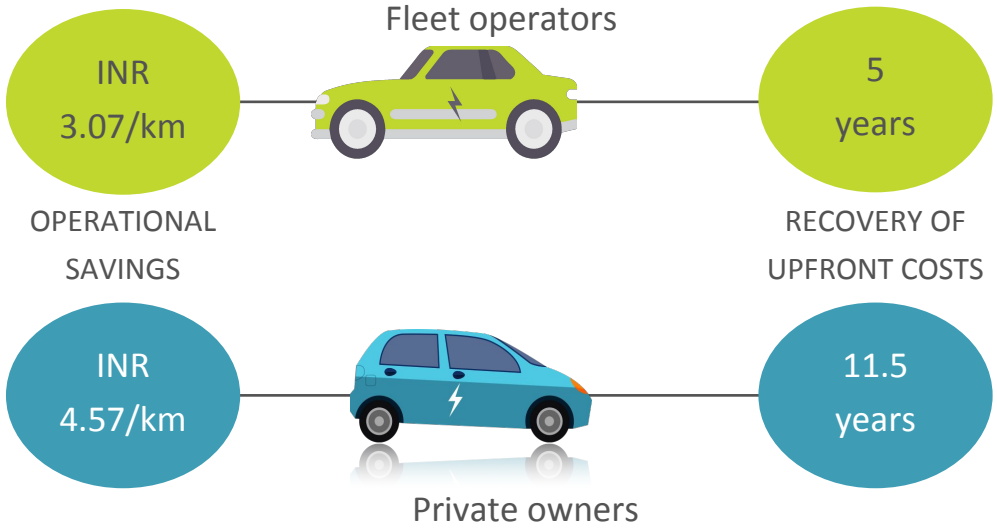
High OpEx negatively affects the economic viability of e-mobility projects, thereby hindering growth.

Oct. 2018 onwards





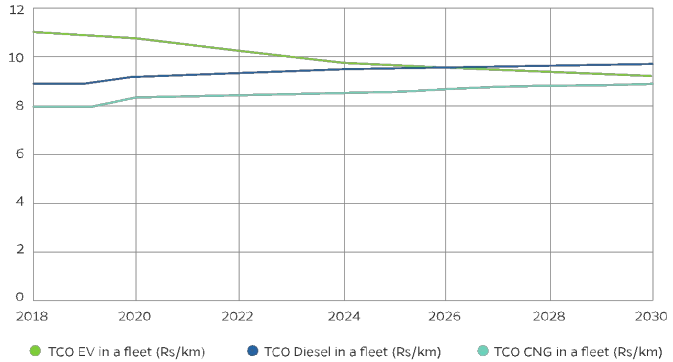
1. The success of e-mobility is hinged on leveraging shared mobility.



2. Vehicle segment prioritisation, with an eye on TCO viability, is at the heart of the EV adoption drive across the country.

3. TCO parity must be achieved for the viability and sustainability of e-mobility in India. Financial viability is the only way to have a Sunset Clause in EV promotion policies.

Tipping point for 4w is years away



Total Cost of Ownership in an ideal scenario (INR / KM)


2.25


2.03


3.73

Electric Vehicle


3.44

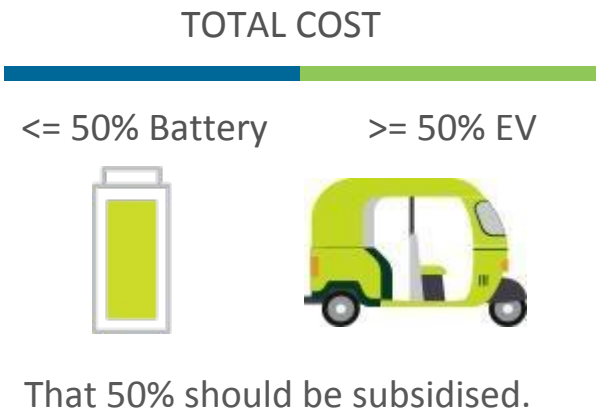
ICE Vehicle

4. Incentives should be on USAGE rather than the purchase of EVs.

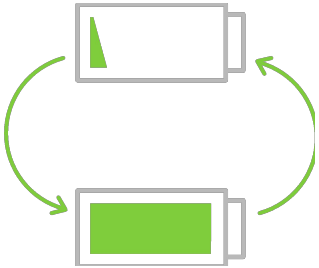
- naturally promote the electrification of high-utilisation vehicles

- Prime Minister of India at the MOVE Summit, 2018, New Delhi.

5. Fiscal incentives should be designed to specifically subsidise the one cost that makes EVs expensive: batteries.



6. Battery swapping is doable, efficient, and in the case of Nagpur, successful.



GREENLIGHT | Battery Swapping (May 2019)

GREENL!GHT

POLICY DIALOGUES BY OMI

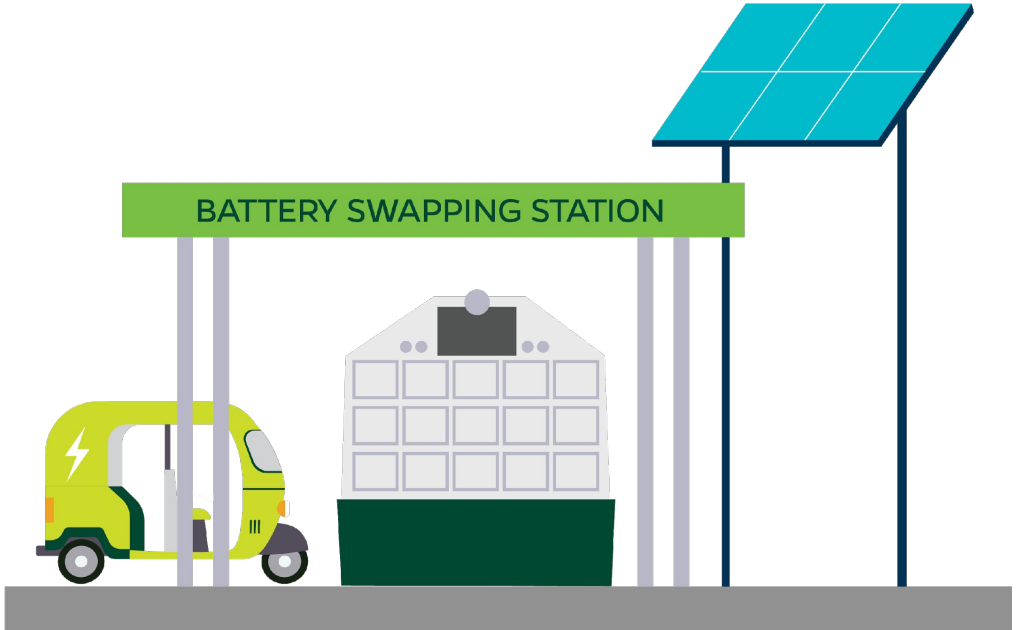
a curated conversation on policy opportunities to enable innovation and growth

SUN MOBILITY · INVEST INDIA (National Investment Promotion and Facilitation Agency) · Exicom · EESL · SB Energy (SoftBank Group) · KINETIC GREEN (A Better Tomorrow) · CII · NITI Aayog · Delhivery · THE WORLD BANK · TATA POWER

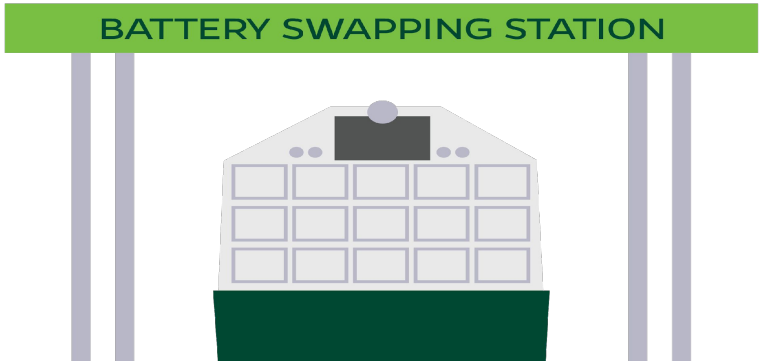
36 stakeholders & observers | **90** minutes | **1** shared resolution

Can Battery Swapping Propel India's EV Dreams?

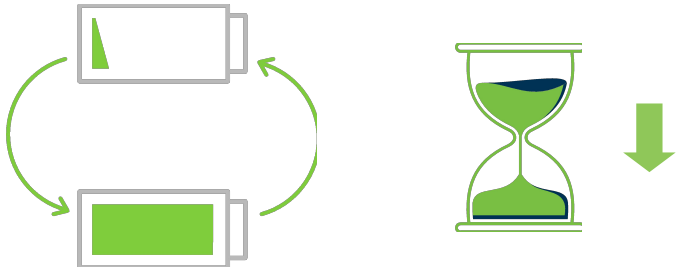
As we have seen in Nagpur, for small vehicles, battery swapping is the solution.



How does battery swapping benefit stakeholders?



Mimics the experience of existing fuel pumps.

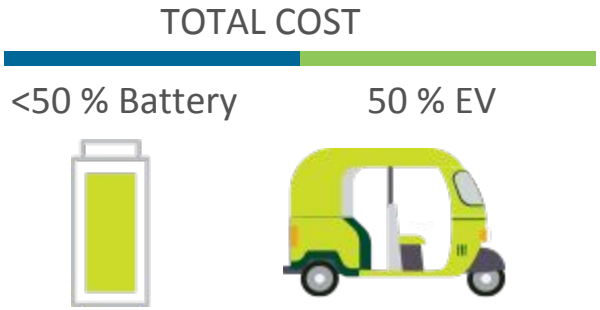


Swapping eliminates wait time for charging.

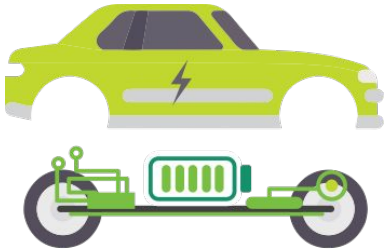
Increases run-time.

Improves remunerative opportunities for shared e-mobility drivers.

Benefits of Battery Swapping to Users



Battery constitutes upto 50% of the cost of the EV!

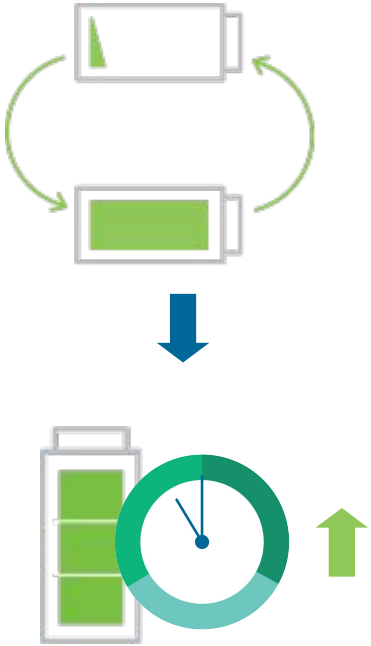


Separate the battery from the vehicle

Reduces the upfront cost of EVs, and improves demand.

Photo credit: https://hackernoon.com/taiwan-startup-gogoro-aka-the-scooter-of-tesla-fbc226bccfa3, https://electrek.co/2018/09/11/yamaha-gogoro-build-battery-swapping-electric-scooters/

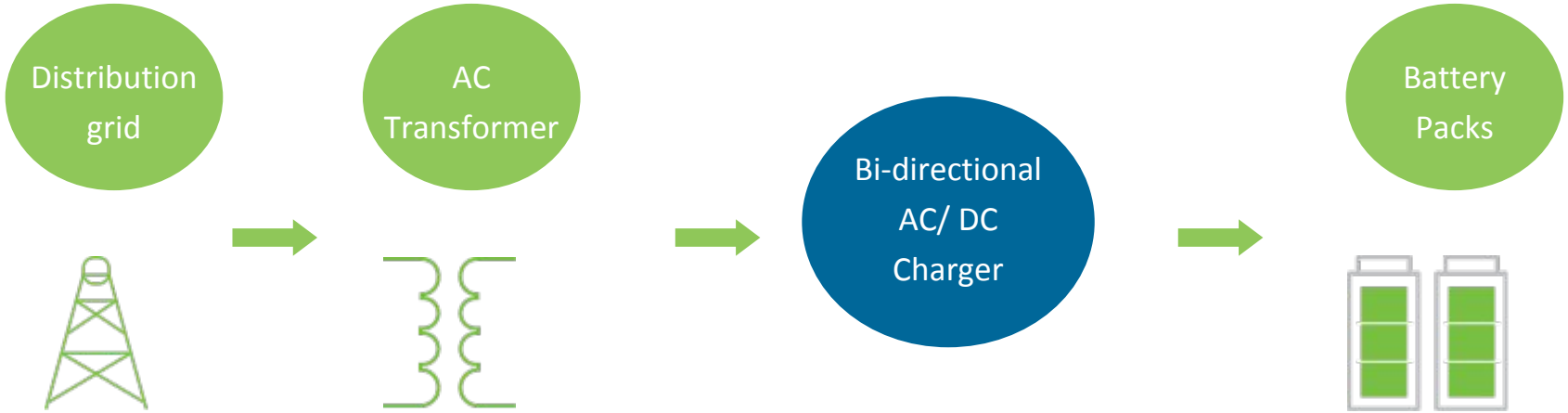
Benefits of Battery Swapping to Users



Improves battery life and reduces anxiety

Increases revenue.

Swapping provides grid-balancing solution.
a. Balances the demand load.
b. Provides energy storage.

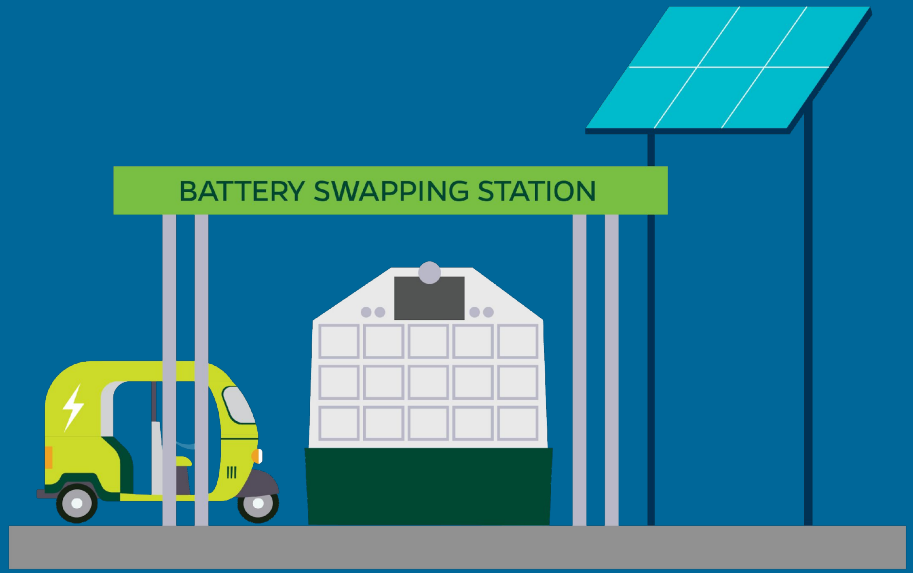


Improves the utilisation of land and reduces fiscal burden

vs.

Photo credit: https://indiatech.solarenergyevents.com/2019/01/15/energy-storage-in-india-a-year-of-action-lies-ahead-of-us/
Photo credit: https://www.rushlane.com/delhi-metro-electric-rickshaw-12276579.html

Swapping introduces new business models, entrepreneurial opportunities.



Creates a pathway to global leadership in innovation

What's the role of the government?

India is charged to become a global hotspot for electric mobility.

FAME
Phased Manufacturing Programme
Public charging guidelines
Building bye-laws amendments

Legend:

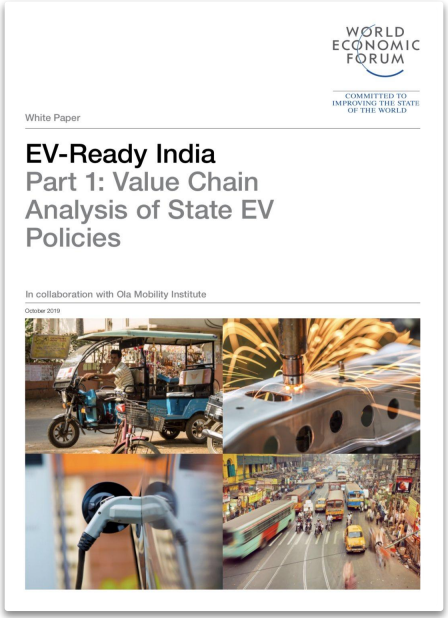
1. **Andhra Pradesh**
2. **Bihar**
3. **Delhi**
4. **Karnataka**
5. **Kerala**
6. **Maharashtra**
7. **Tamil Nadu**
8. **Telangana**
9. **Uttarakhand**
10. **Uttar Pradesh**

11. **Punjab** released a draft in November 2019

Cradle to Grave & Cradle to Cradle Sustainability;
Circular Economy

EV Ready India (October 2019)

live mint | The Economic Times | Business Standard | hindustantimes



"best work on state EV policies in India. Great resource for states looking to launch/ refresh their EV policies"
-WBCSD

"good document to understand the state level EV policy and key components of EV ecosystem"
-WRI

"commendable work towards EV ecosystem awareness"
- Sun Mobility

"The report has some key insights that'll be very relevant for the sector moving forward"
- Invest India

Manufacturing



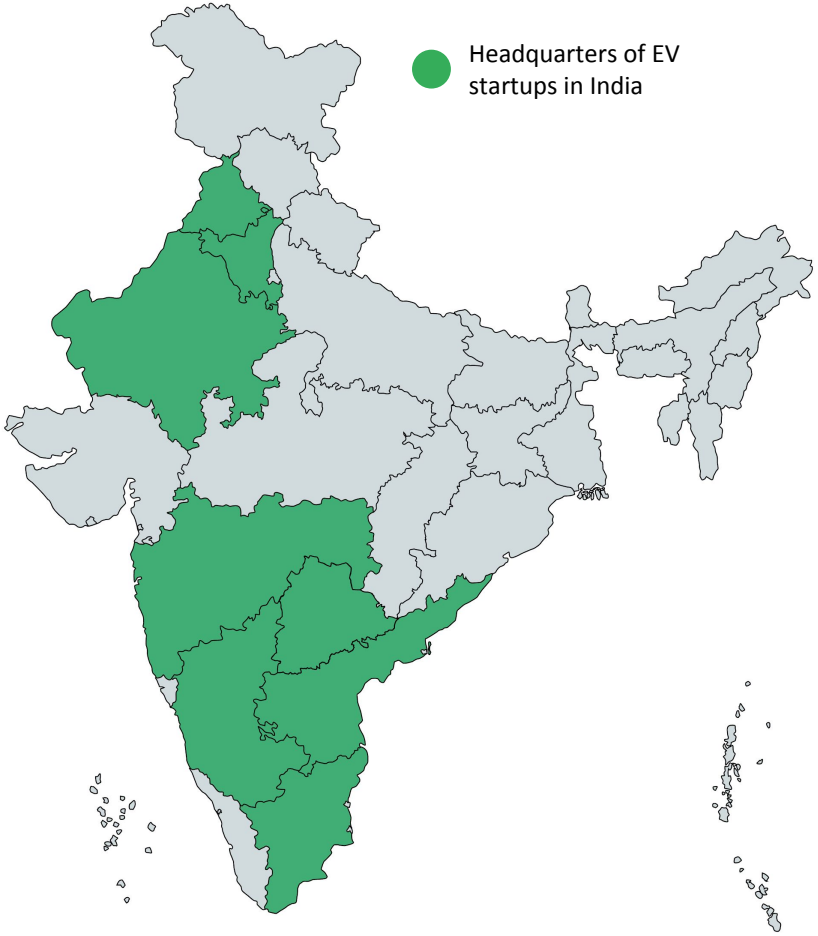

Rideshare & Logistics

Battery and Energy Operations (Charging, Swapping)

IOT, Telematics, AI, and Components

Source: Inc42

Venture Funding of EV Startups



2017-19:

USD 500+ million

worth disclosed **investments**

in **20+ EV Startups**

Source: Inc42

Future of Mobility in India

Advantage India

Growing Demand

Changing consumer patterns

Businesses aiding maximum asset-utilisation

Policy Support

Global leader of Innovations and Manufacturing

Reforms such as GST

Opportunities

Leader in Shared, Connected, Electric mobility by 2030

Skilling, Jobs, Micro-entrepreneurship

MSME businesses

Rising Investments

Increasing FDI and Private Equity / Venture Capital Funding

Cost advantage attracting investments in the mobility domain

Source: SCI

Recap

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  - ◆ Global Trends
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