

INDIA



POPULATION 2016
1 324 171 354



URBAN POPULATION %
33 %



NUMBER OF PASSENGER CARS IN USE
22 468 000



NUMBER OF VEHICLE PER HEAD
(DATA IN 2015) PER 1000 HABITANT
50



TOTAL PASSENGER ROAD TRAVEL
DISTANCE 2016
(MILLION PASSENGER-KILOMETRES)
1 027 629



ROAD INFRASTRUCTURE
INVESTMENT 2017 €
15 107 533 593



% OF GLOBAL ELECTRIC VEHICLES
SALES IN 2017
LESS THAN 5%

Source of data: World Bank; OECD; Eurostat; OICA; IEA; UN-DE-SA/Population Division; Statistics from Departments of Transport



Bharat Dhawan
Managing Partner, Mazars India

Unlocking India's sustainable mobility potential

With India's transition to a more sustainable mobility model unclear following the withdrawal of ambitious electric vehicle targets, Bharat Dhawan, Managing Director at Mazars India looks at the key themes behind India's sustainable mobility aspirations and asks whether industry collaboration is the answer?

With a population of over 1.3 billion people, rising urban incomes and low car ownership per capita, India is seen as a growth market for the automotive industry. But as a global push for more sustainable mobility solutions gains environmental approval, whether India can keep pace will be determined by three themes.

1. PARALLEL DEVELOPMENT

Vehicle congestion is a major problem for India's cities. While banning diesel vehicles more than 10 years old from the likes of Delhi city centre is a step in the right direction in terms of reducing pollution, the sheer numbers of two and four wheeled vehicles on the streets of India's major cities and growing urban areas requires a more joined up approach than simply banning fuel-powered vehicles in favour of electric. Digital development of shared mobility solutions, including ride sharing and public transport have key roles to play in India's transition to a sustainable mobility solution. Connected mobility solutions at B2B (business to business), B2C (business to customer) or P2P (peer to peer) level from the likes of Door2Door, Uber, Ola and Via as well as a focus on more electric public transport vehicles are already helping to make Indian city's smarter and reducing individual travel needs.

Parallel policies that develop shared mobility solutions alongside encouraging environmentally-friendly vehicle ownership are likely to improve India's sustainable mobility transition.

2. COMPETITIVE AMBITIONS

Ambitions by Indian and Indian-based companies in the automotive sector and wider supply chain should not be underestimated. While the slow speed of electric vehicle (EV) take up in India due to cost of ownership, the government's backtracking on its goal to fully switch to electric vehicles by 2030 and a lack of infrastructure is conspiring to put India behind the race to reach a sustainable mobility solution, companies are not prepared to remain at a competitive disadvantage. In February 2018, India's Mahindra Electric announced a partnership with Korean company, LG Chem, to develop new lithium-ion cells and battery packs exclusively for the Indian EV market. Similarly, Tata Motors has also developed a long range battery pack for the Indian market with a range of over 300 kilometres per charge to match the popular Nissan Leaf. The development of sustainable mobility solutions by companies such as Tata and Mahindra independently of government policy will ensure that India's ambitions in the sector remain on track nationally and internationally.

3. WIDER INDUSTRY COLLABORATION

For many countries the lack of charging station infrastructure is a main deterrent to EV take-up. However, in India the lack of basic infrastructure per se requires a different approach. In order for sustainable mobility needs to be met requires road transport facilities to be improved and utilities infrastructure such as electricity and telecommunications to be strengthened, not only in urban cities but also rural areas.



Nicolas Ribollet
Partner, Mazars France

What clues does the current automotive landscape in India hold in helping companies to identify a suitable sustainable mobility strategy? **Nicolas Ribollet**, Partner, Mazars in India and France explores potential options.

India's opportunistic approach and ability to adapt quickly alongside strong IT skills are highly prized attributes in today's technology-focused business environment. So can India's automotive sector use such capabilities to develop the market for sustainable mobility solutions? What's becoming clear is that progress will not simply depend on having the appropriate skills or mindset. Equally important to unlocking India's sustainable mobility potential will be understanding what works in the current market and how companies can embed those ideas into an appropriate strategy going forward.

COMBINING TECHNOLOGY AND SOLUTION-BASED SKILLS

There are two aspects to India's automotive industry, one based on strong IT capabilities and the other based on an ability to find dynamic yet cost-effective solutions. While cost is an important factor for Indian car ownership, throw into the mix India's aspirational and growing middle class and solutions become more complex to define. You need look no further than Tata Motor's Nano car launched in 2009 costing approximately \$2,000. Billed as the cheapest car in the world, the Nano provided a solution on cost, but could not initially live up to consumer expectations. Tata is

The synergies between the need for improved transport infrastructure and a more software and technology focused automotive sector are increasing rapidly. While there are government plans in motion to improve basic infrastructure, there's a case for wider collaboration between infrastructure industries and the automotive sector in order to fast-track ideas to ensure sustainable mobility plans are met.

using the experience to develop an EV version, but it provides a valuable lesson in that an approach which can dovetail India's technical knowhow with solution-based capabilities more in tune with consumer demands will be key to achieving sustainable mobility success.

TRANSACTION TRENDS

Just four OEMs account for 75% of car sales in India - Maruti Suzuki, Hyundai, Mahindra & Mahindra and Tata Motors. Maruti Suzuki alone has more than a 40% market share. Such high market concentration means for many companies looking to gain a foothold in India's booming automotive market, buying into the market through OEMs and suppliers that are either based in India or have a business relationship in India is the preferred approach. A rapidly growing economy means transaction activity continues to be strong in most automotive segments, including two wheelers and commercial vehicles, not only from international OEMs, but also vertical transaction activity between Indian companies looking to consolidate or grow their market presence. In the other direction, Indian companies are looking to acquire international expertise that will give them an edge in the market, either through technology or smart component expertise. While a similar transaction pattern of buying in expertise in order to

meet sustainable mobility needs is expected, start-ups focusing on technology will challenge the status quo, particularly in the shared economy sector.

SPEED OF TRANSITION

Despite a huge and growing automotive market, India's take up of electric vehicles (EVs) is slow mainly due to lack of infrastructure to support growth. However, India's de-carbonisation policy has seen an increase in renewable energy infrastructure, particularly in solar, hydro and wind power, which may be the push needed to give EVs a much needed boost in popularity. Indeed, legislation introduced to tackle pollution provides a good benchmark on how quickly changes can happen, with Government implementation requirements typically taking months rather than years. Once better infrastructure is in place and incentives and legislation to promote sustainable mobility solutions are introduced, the transition to hybrid, electric and autonomous cars in India is likely to be quicker than seen in many other countries.

THE IMPORTANCE OF PRODUCT ADAPTATION

Cost, small size, reliability and good resale value are the main reasons why consumers continue to buy the 800cc Maruti Alto, which is India's best-selling car. With its extraordinary market share, Maruti is also bucking the trend in anticipating future needs. It is one of the few companies, alongside Tata and Hyundai that produces vehicles with factory-fitted Compressed Natural Gas (CNG) engines as India's move away from diesel engines on pollution grounds gather's pace. The main reason for companies failing to succeed in India's competitive automotive market is often due to not adapting products to fit market requirements. Once sustainable mobility options such as hybrids and EVs tick the boxes on size, cost, reliability and resale value they will have gone a long way to fulfilling Indian market requirements.




CASE STUDY:

New Delhi



~26 Mn
 POPULATION
 (2016)


~2,8 Mn
 CAR OWNERS
 (2014-15)


~2,4 Mn
 METRO RIDESHIP
 (2014-15)


3,3 Mn
 HOUSEHOLDS
 (2014-15)


1 483
 DELHI AREA
 (SQ.KM)


INR 0,24 Mn
 AVERAGE ANNUAL PER CAPITAL
 INCOME (2014-15)




2.8 Mn
 CAR OWNERSHIP
 (2014-15)


5.5 Mn
 BIKE OWNERSHIP
 (2014-15)


4,700
 DTC BUS
 REGISTERED
 (2014-15)


81,269
 AUTO RICKSHAW
 (2014-15)

CASE ASSUMPTIONS

PERSONAL OWNERSHIP MODEL



There are 2.8 Mn Cars for 3.3 Mn Households in 2014-15. The penetration of cars per households stands at 85%. We assume that households of Delhi grow at 2% , hence in 2030, households stand at 4.5 Mn. To cater 4.5 Mn households let there be car penetration of 90%. Hence Cars in 2030 stands at 4.07 Mn.



We assume that, in a year a personal owned car covers an average of 12,000 Km in a Year.

RIDE SHARING



It is assumed that each ride sharing car will carry a total of 4 passengers across each journey.



In each case, it is assumed that 100% ride shared cars and 50% of personal cars will be electric



Each ridesharing vehicle is assumed to cover an average distance of 24,000 km/year.

VEHICLE ECONOMICS

- ✓ Operating costs for a Private 4w EV, Private 4w Petrol and Shared 4w EV are assumed to be 0.20, 0.27 and 0.09 USD/km respectively.
- ✓ Operating cost for a Public Transit EV is assumed to be 0.27 USD/km, as per the expenditure undertaken from the DTC Report.



EVS CAN HELP REDUCE the burden of rising gas pricing by 26.2%

20% EVS

20% ELECTRIC VEHICLE + 80% INTERNAL COMBUSTION ENGINE

Data Points	Size
Avg Distance Covered - Year	12,000 Km
Cars in 2014-15	28,00,000
Cars in 2030	40,77,174
Estimated Electric Vehicles 2030	8,15,435
Estimated ICE's (Petrol) 2030	32,61,739
Avg Distance covered by EV's	9,78,52,16,506 km
Avg Distance covered by ICE's	39,14,08,66,024 km
Personal 4w EV (USD/KM)	0.20
Personal 4w Petrol (USD/KM)	0.27

TOTAL RUNNING COST: \$ 12.5 BN

50% EVS

50% ELECTRIC VEHICLE + 50% INTERNAL COMBUSTION ENGINE

Data Points	Size
Avg Distance Covered - Year	12,000 Km
Cars in 2014-15	28,00,000
Cars in 2030	40,77,174
Estimated Electric Vehicles 2030	20,38,587
Estimated ICE's (Petrol) 2030	20,38,587
Avg Distance covered by EV's	24,46,30,41,265 km
Avg Distance covered by ICE's	24,46,30,41,265 km
Personal 4w EV (USD/KM)	0.20
Personal 4w Petrol (USD/KM)	0.27

TOTAL RUNNING COST: RMB 11.5 BN

80% EVS

80% ELECTRIC VEHICLE + 20% INTERNAL COMBUSTION ENGINE

Data Points	Size
Avg Distance Covered - Year	12,000 Km
Cars in 2014-15	28,00,000
Cars in 2030	40,77,174
Estimated Electric Vehicles 2030	32,61,739
Estimated ICE's (Petrol) 2030	8,15,435
Avg Distance covered by EV's	39,14,08,66,024 km
Avg Distance covered by ICE's	9,78,52,16,506 km
Personal 4w EV (USD/KM)	0.20
Personal 4w Petrol (USD/KM)	0.27

TOTAL RUNNING COST: \$ 10.4 BN

Source: Mazars' Global Knowledge Center Analysis; Research paper (Congestion cost incurred on Indian Roads); Travel Behavior and Society; Press articles



RIDE SHARING CAN HELP REDUCE the ownership cost by 69.3%, congestion by 60% and Pollution

20% RIDE SHARING

20% RIDE SHARING + 80% PERSONAL CARS (WITH 50% EV)

Data Points	Size
Avg Distance - YR (Ride Sharing)	24,000 Km
Avg Distance - YR (Personal Car)	12,000 Km
Ride Sharing (2030)	2,03,859
Personal Ownership (2030)	32,61,739
Estimated EVs 2030	18,34,728
Estimated ICEs (Petrol) 2030	16,30,869
Avg Distance Covered by EVs	24,46,30,41,265 km
Avg Distance Covered by ICEs	19,57,04,33,012 km
Shared 4w EV (USD/KM)	0.09
Private 4w EV (USD/KM)	0.20
Personal 4w Petrol (USD/KM)	0.27

TOTAL RUNNING COST: \$ 9.6 BN

50% RIDE SHARING

50% RIDE SHARING + 50% PERSONAL CARS (WITH 50% EV)

Data Points	Size
Avg Distance - YR (Ride Sharing)	24,000 Km
Avg Distance - YR (Personal Car)	12,000 Km
Ride Sharing (2030)	5,09,647
Personal Ownership (2030)	20,38,587
Estimated EVs 2030	15,28,940
Estimated ICEs (Petrol) 2030	10,19,293
Avg Distance Covered by EVs	24,46,30,41,265 km
Avg Distance Covered by ICEs	12,23,15,20,632 km
Shared 4w EV (GBP/km)	0.09
Private 4w EV (GBP/km)	0.20
Private 4w Petrol (GBP/km)	0.09

TOTAL RUNNING COST: \$ 6.8 BN

80% RIDE SHARING

80% RIDE SHARING + 20% PERSONAL CARS (WITH 50% EV)

Data Points	Size
Avg Distance - YR (Ride Sharing)	24,000 Km
Avg Distance - YR (Personal Car)	12,000 Km
Ride Sharing (2030)	8,15,435
Personal Ownership (2030)	8,15,435
Estimated EVs 2030	12,23,152
Estimated ICEs (Petrol) 2030	4,07,717
Avg Distance Covered by EVs	24,46,30,41,265 km
Avg Distance Covered by ICEs	4,89,26,08,253 km
Shared 4w EV (GBP/km)	0.09
Private 4w EV (GBP/km)	0.20
Private 4w Petrol (GBP/km)	0.09

TOTAL RUNNING COST: \$ 4.06 BN

Source: Mazars' Global Knowledge Center Analysis; Research paper (Congestion cost incurred on Indian Roads); Travel Behavior and Society; Press articles

