

How does Intermediate Public Transport (IPT) System Operate in Lucknow?

Udit Narayan Mall, Samradh Singh Chauhan, Nilanshu Ghosh, and Himani Jain

Report | April 2023

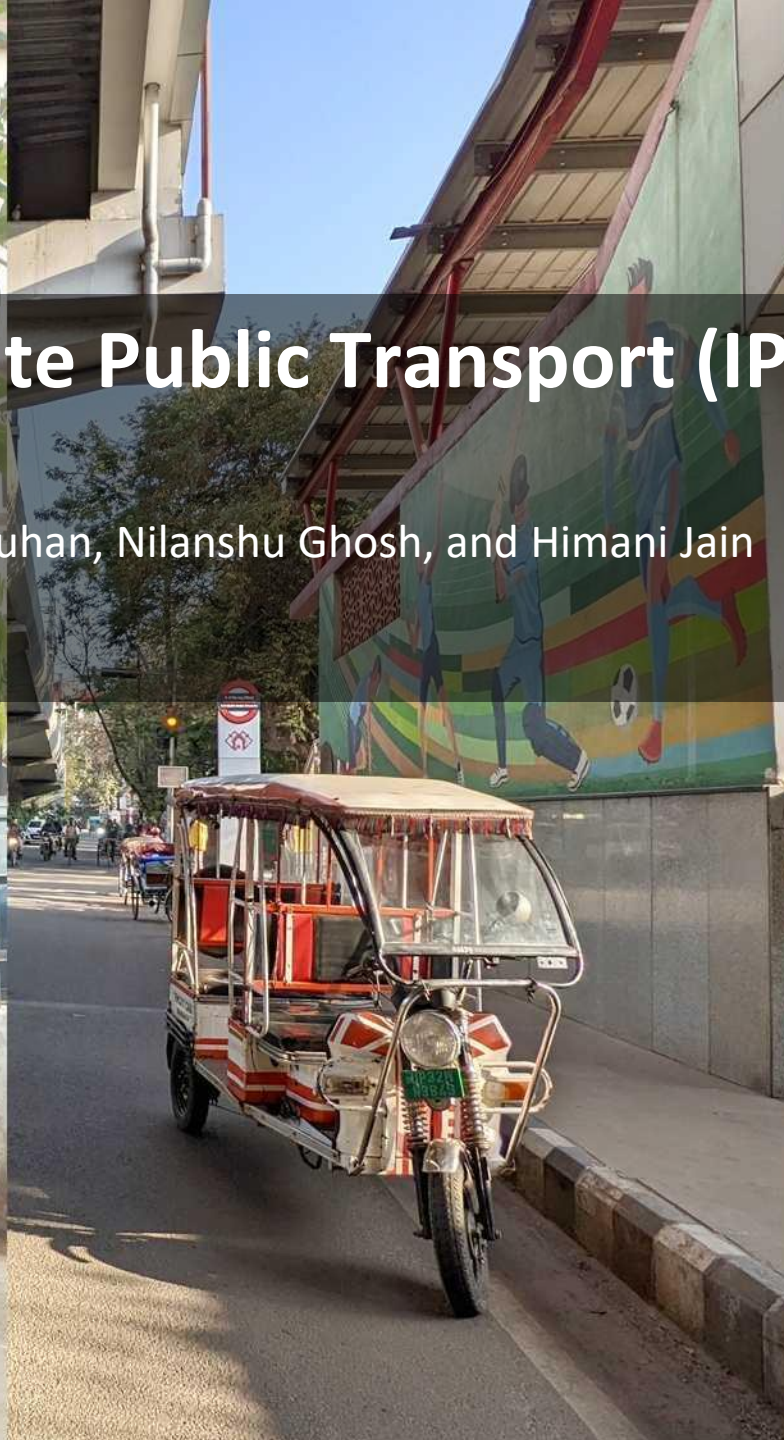




Image: Samradh Singh Chauhan/CEEW

About this report

This report presents daily operational characteristics of Intermediate Public Transport (IPT) vehicles in a typical million-plus city of India, i.e. Lucknow. These vehicles include auto-rickshaws, tempos and e-rickshaws. The report provides evidence help transport planners and policymakers to plan IPT systems, and to gauge their electrification potential, effectively.



Image: CEEW

About the project: Electrification of Fleets in City Clusters

A CEEW project aimed to assess the potential for fleet electrification across vehicle segments. The project focused on Lucknow in Uttar Pradesh and Kochi in Kerala. The electrification potential of several fleets was examined through PESTEL (political, economic, social, technological, environmental, and legal) analysis in which IPT vehicles emerged as a high-potential vehicle segment.

Private transport is the preferred transport mode in Lucknow, with a modal share of 47%

3.7 million

Projected population as of 2021¹

2.8 million

Registered vehicles as of 2021²

3% PT & 17% IPT

The lack of public transport (PT) in Lucknow modal share of IPT has resulted in the higher



42%

The modal share of 2-wheelers in Lucknow city

6-8 seaters

Tempos are a part of this category, including some vans

70% e-rickshaws in IPT

The non-requirement of permits for e-rickshaws has resulted in their higher share⁴

Fixed route tempos cover 49% of the Lucknow city area

44

routes fixed by city authorities for tempo operations⁵

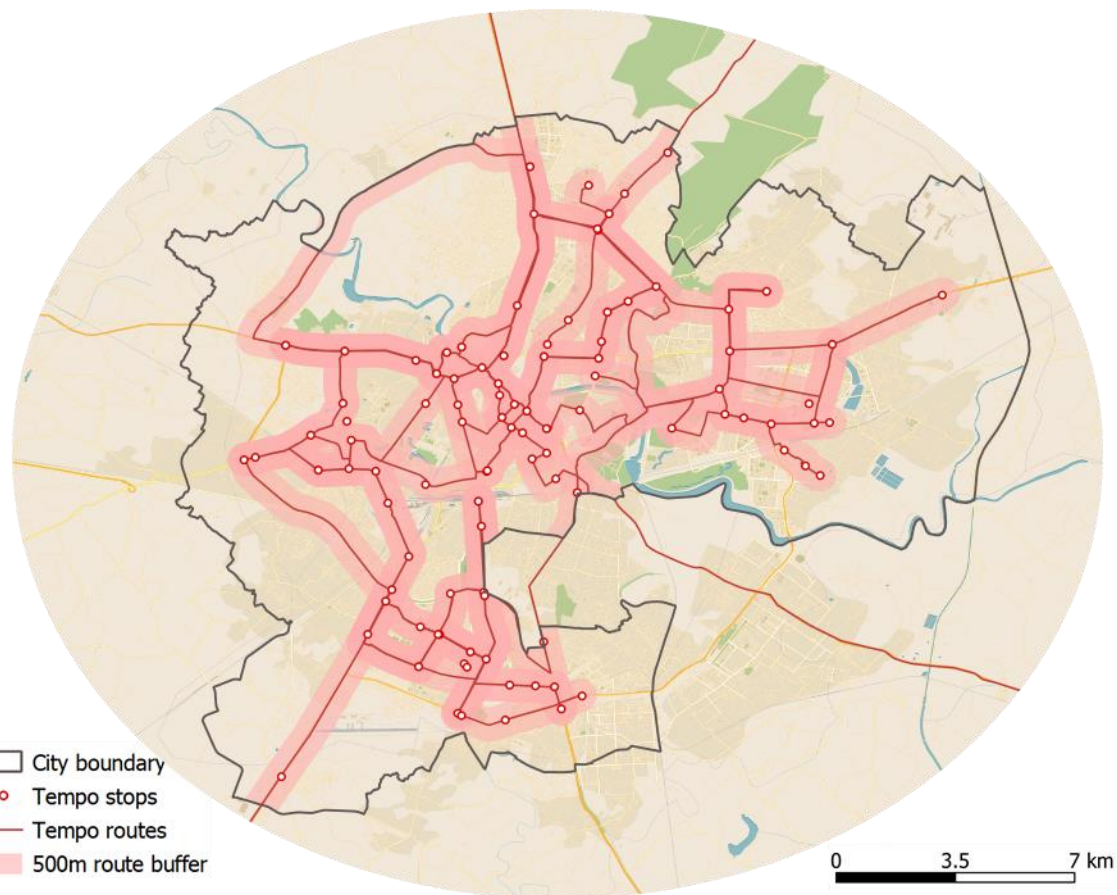
Auto & e-rickshaws

Ply informally on a sharing basis on similarly high-demand routes

500m walkability buffer

created to analyse city coverage by tempos on these routes

Tempo coverage, Lucknow



3-types of IPT

Ply in the city



Tempo



E-rickshaw

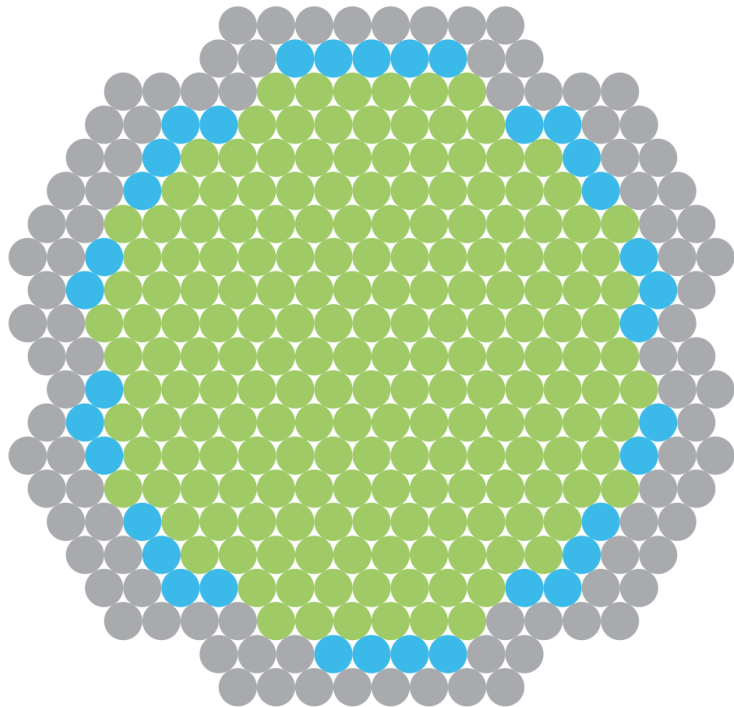


Auto rickshaw

Survey methodology

322

IPT vehicles were surveyed (192 e-rickshaws, 95 auto-rickshaws & 35 tempos)



● Auto rickshaw ● Tempo ● E-rickshaw

*1 dot represents 1 sample

Cochran formula

Used to determine the sample sizes

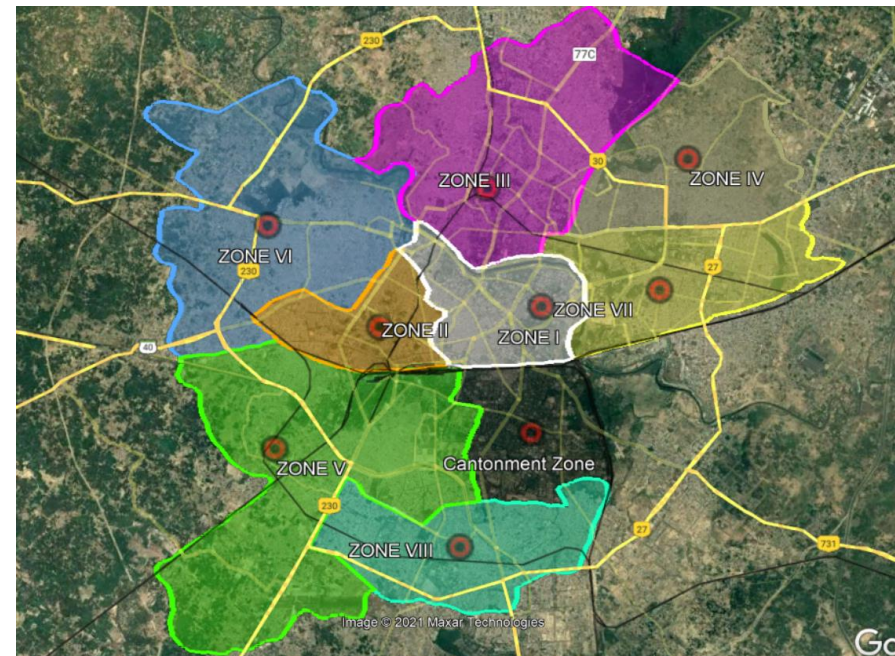
Stratified purposive sampling

is used to collect the survey samples.

Survey locations

Geographically distributed across the municipal zones of Lucknow, IPT halts and parking locations within the city

Survey zones



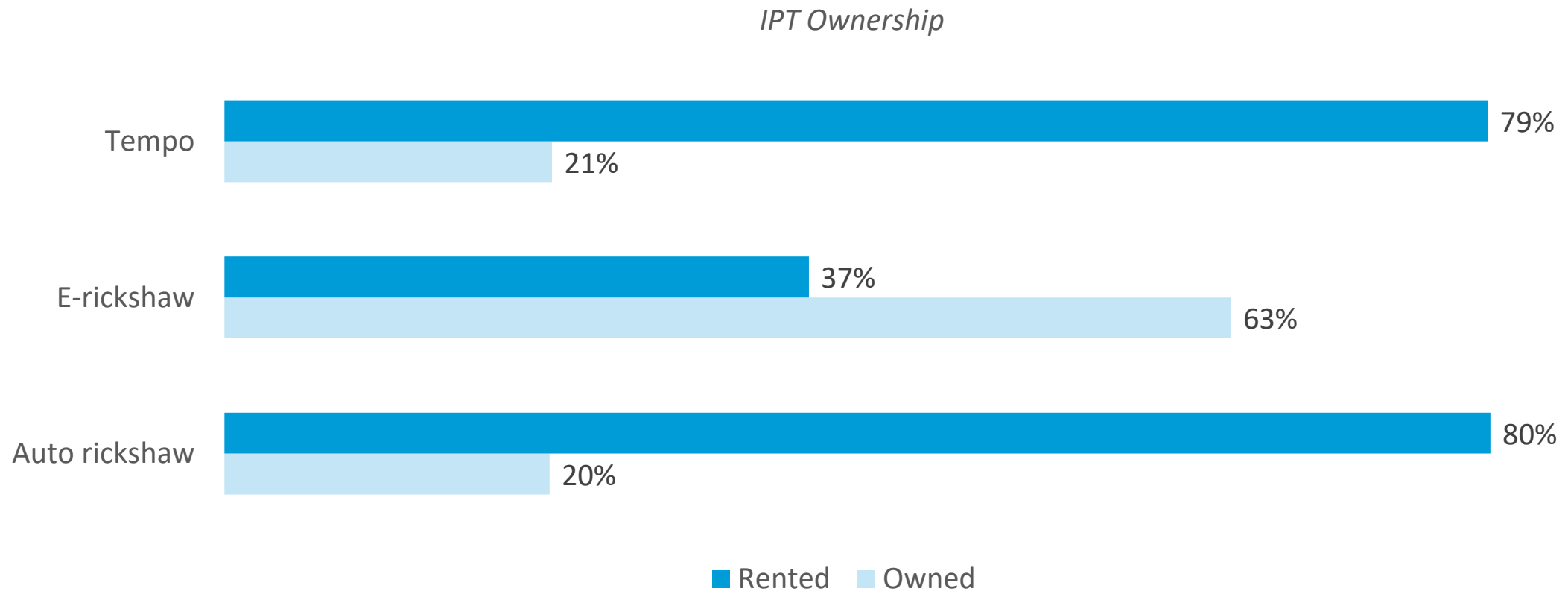
Vehicular characteristics of IPTs

Ownership status | Fleet age | Fuel types

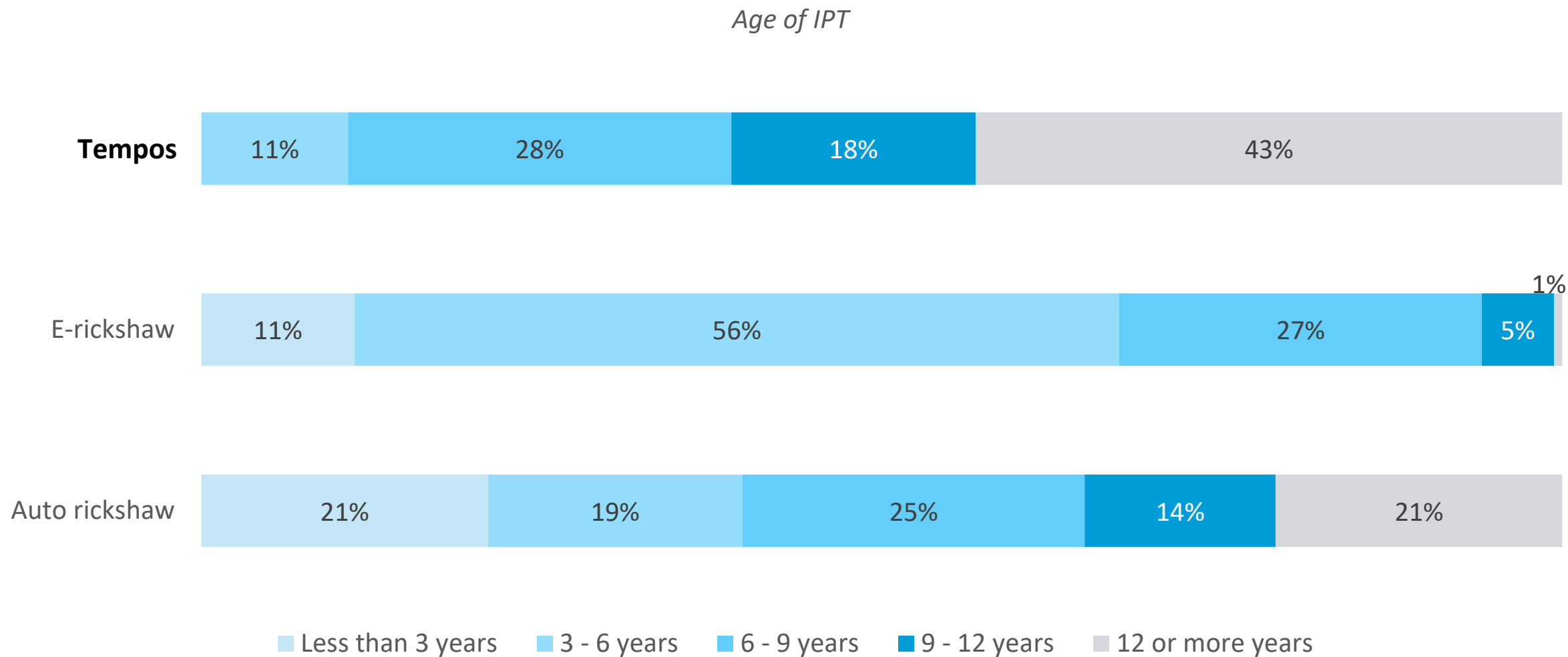


~80% of the tempos & auto-rickshaws are rented as opposed to ~40% e-rickshaws

E-rickshaw ownership is much higher in Lucknow as compared to tempos & auto-rickshaws.

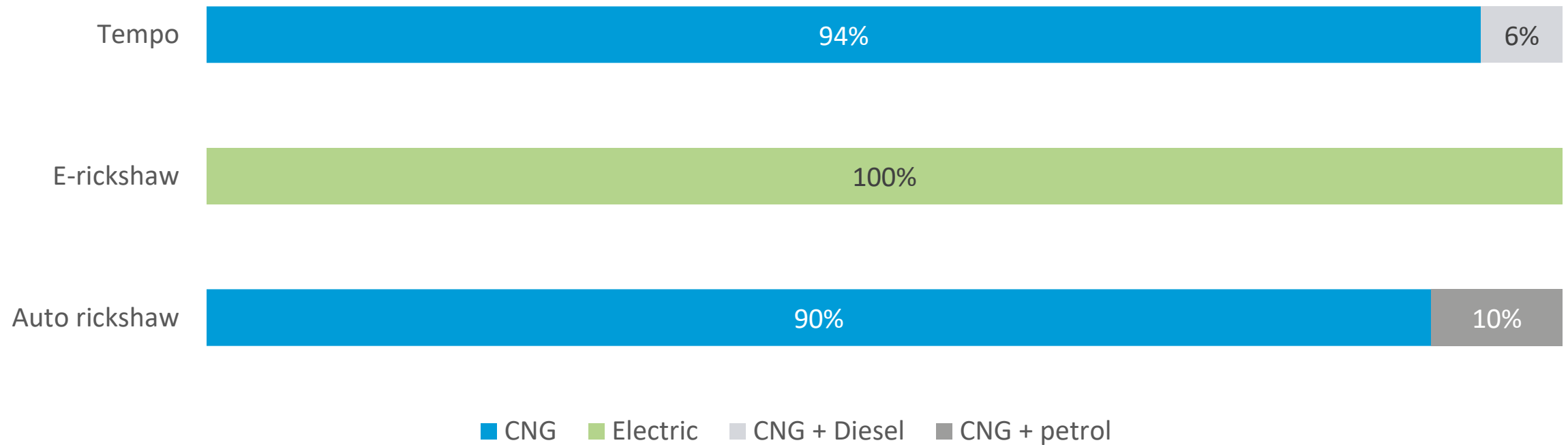


Tempos are the oldest IPT modes, ~60% of the vehicles older than 9 years



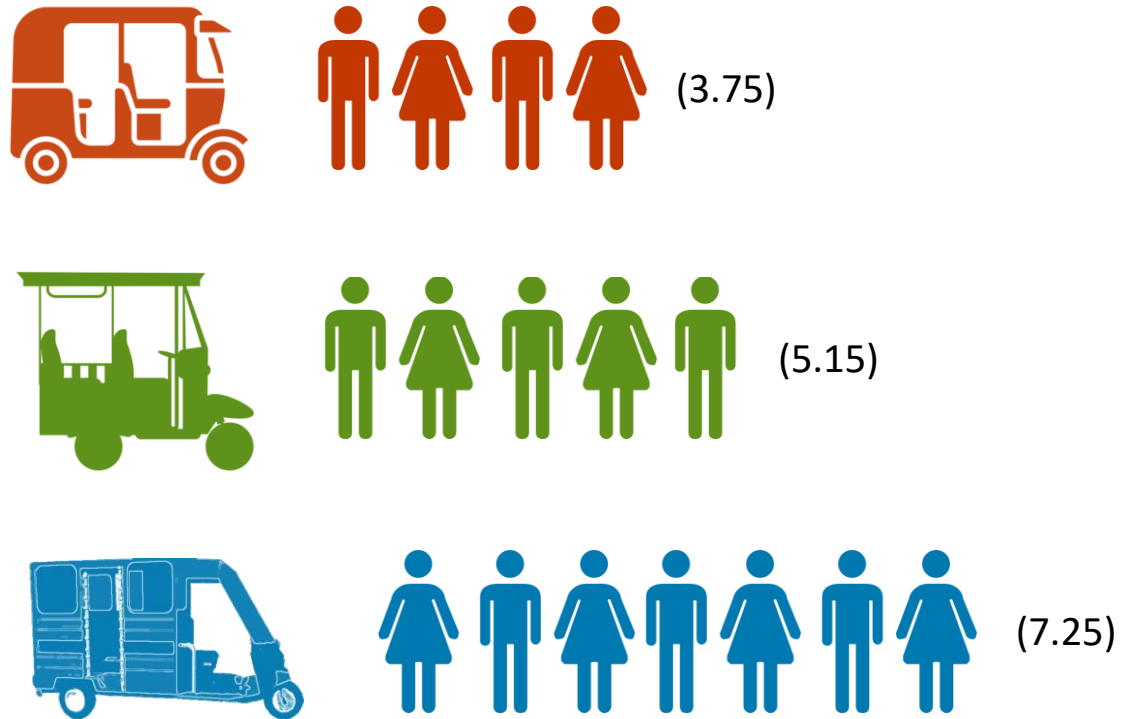
~90% of tempos & auto-rickshaws operate on CNG as the primary fuel

Fuel types used by IPT

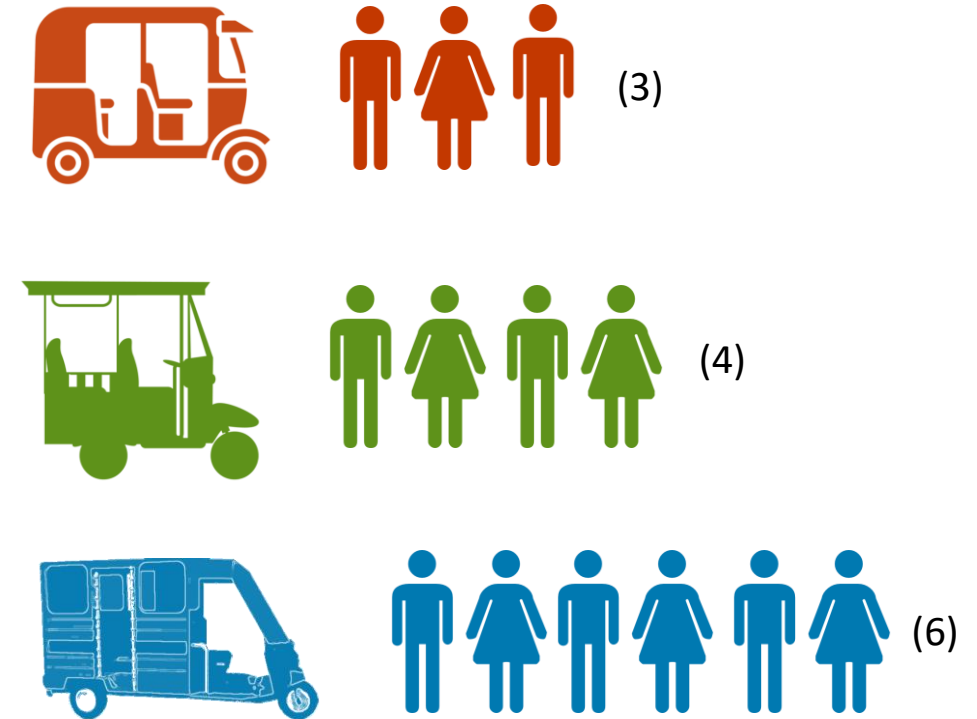


All IPTs carry more passengers than their designed occupancy

Average occupancy in Lucknow



Designed occupancy⁶



Operational characteristics of IPTs

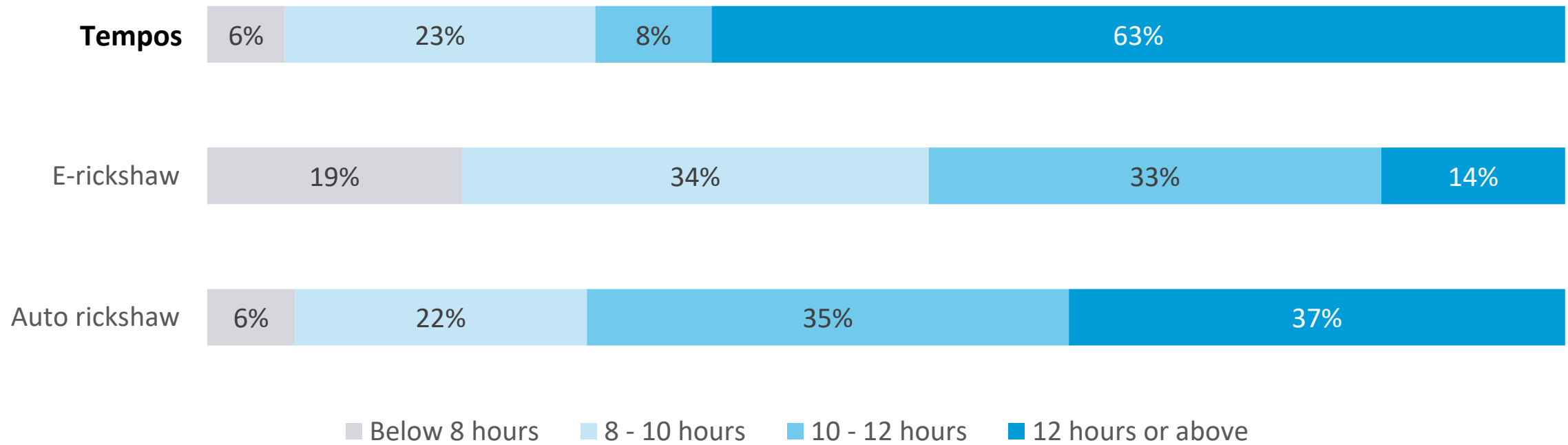
Daily operational hours | Parking & charging | Daily distance travelled | Daily trips



Tempo drivers operate the longest hours, mostly operating ≥ 12 hours

- The majority of e-rickshaws operate ≤ 10 hours
- 72% of auto-rickshaws operate ≥ 10 hours

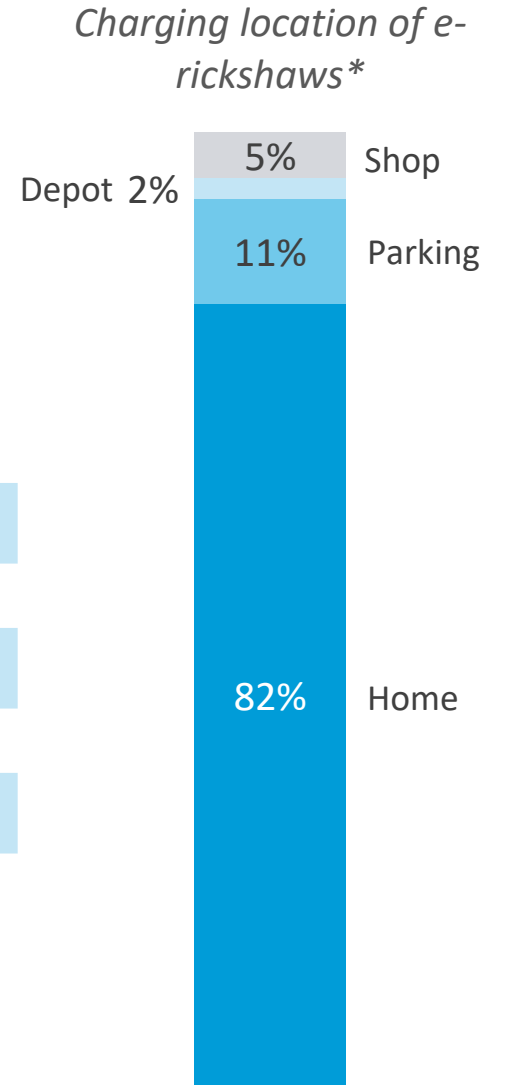
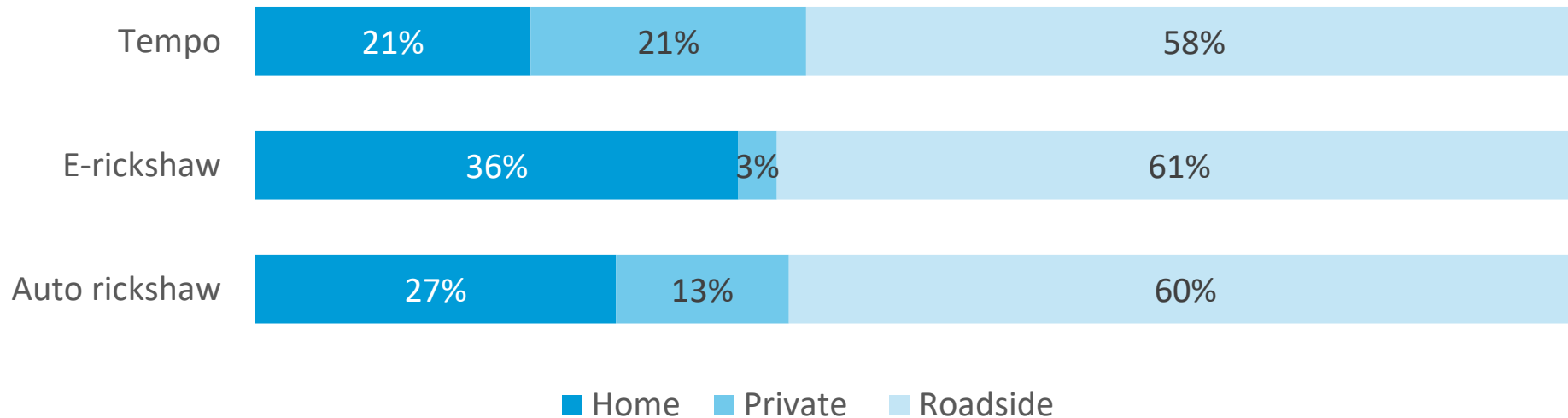
Daily operational hours of IPT



~60% of IPT vehicles are parked on roadsides during non-operational hours

- E-rickshaws are charged mostly at home, with marginal numbers of being charged at parking places, depots or shops
- Only 3% of e-rickshaws are parked in designated parking spots, as compared to 21% of tempos and 13% of autos

Parking during non-operational hours

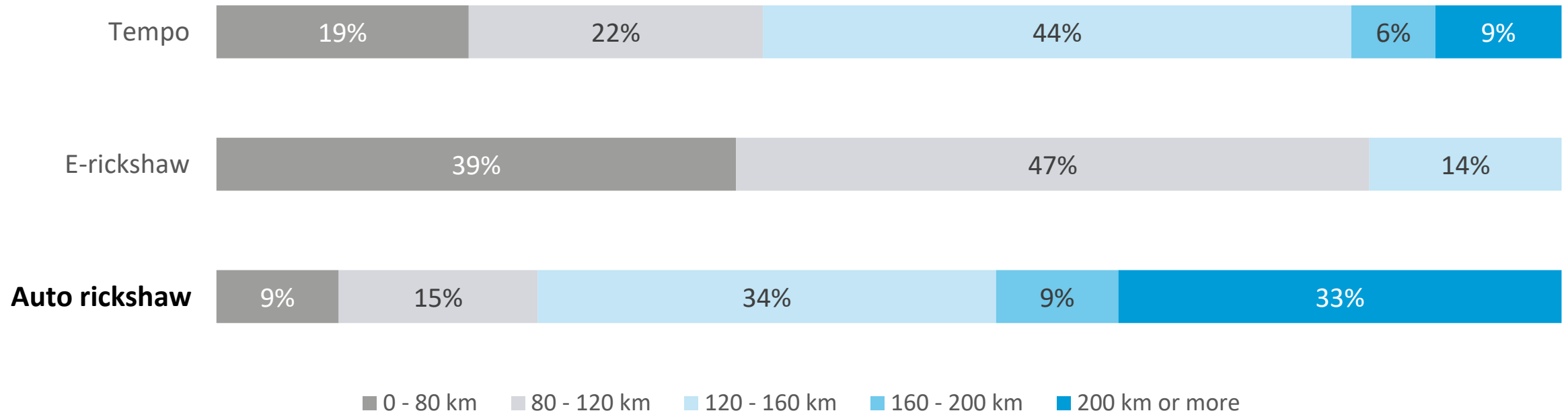


*Most of the e-rickshaws are charged through electricity connection at home and are parked on the roadside during non-operation hours, due to non-availability of parking space at home.

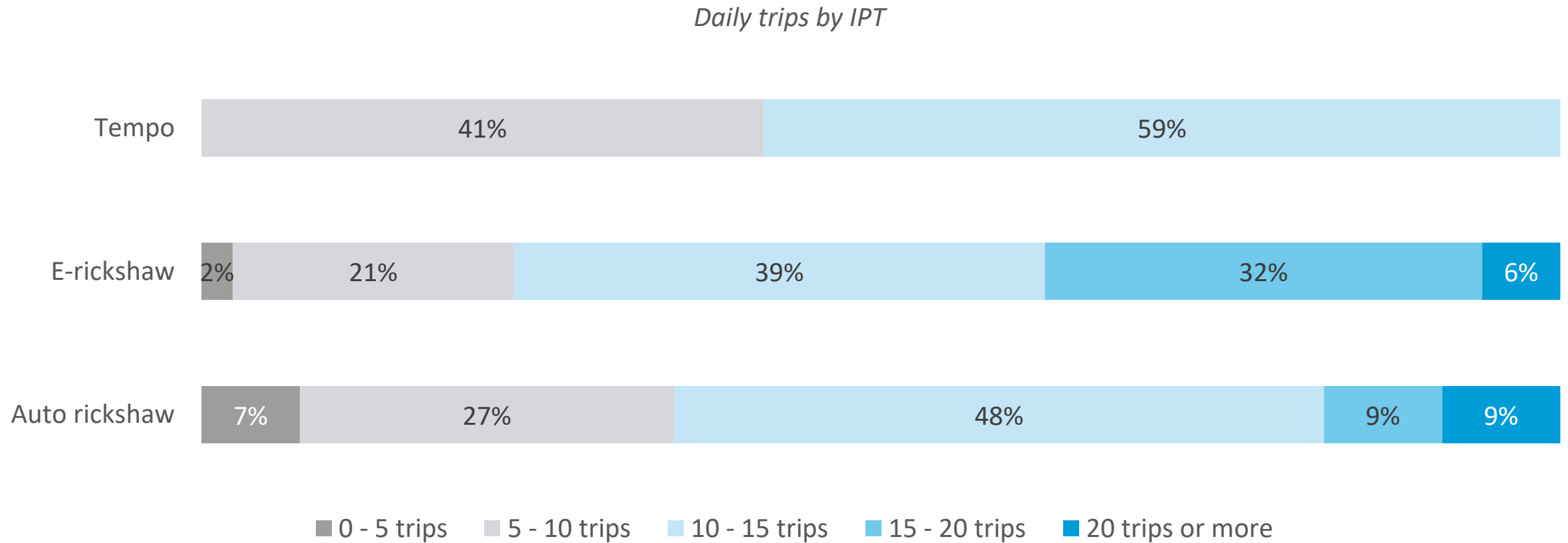
1/3 of auto-rickshaws travel a daily distance \geq 200 km

- 86% of e-rickshaws have a daily travel distance \leq 120 km
- ~60% of tempos travel \geq 120 km daily

Daily distance travelled by IPT



A major share of IPT do 10 to 15 trips per day



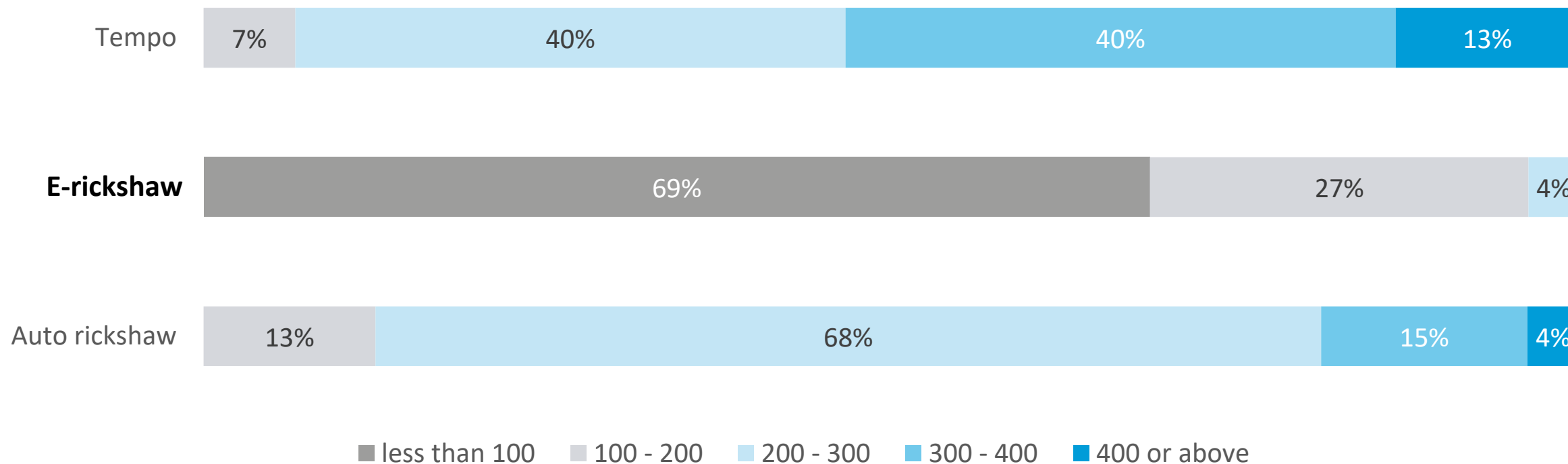
Economic characteristics of IPT

Daily fuel costs | Daily revenue | Annual income of drivers



E-rickshaws have the lowest daily fuel cost, at less than INR 200 per day for almost all the vehicles

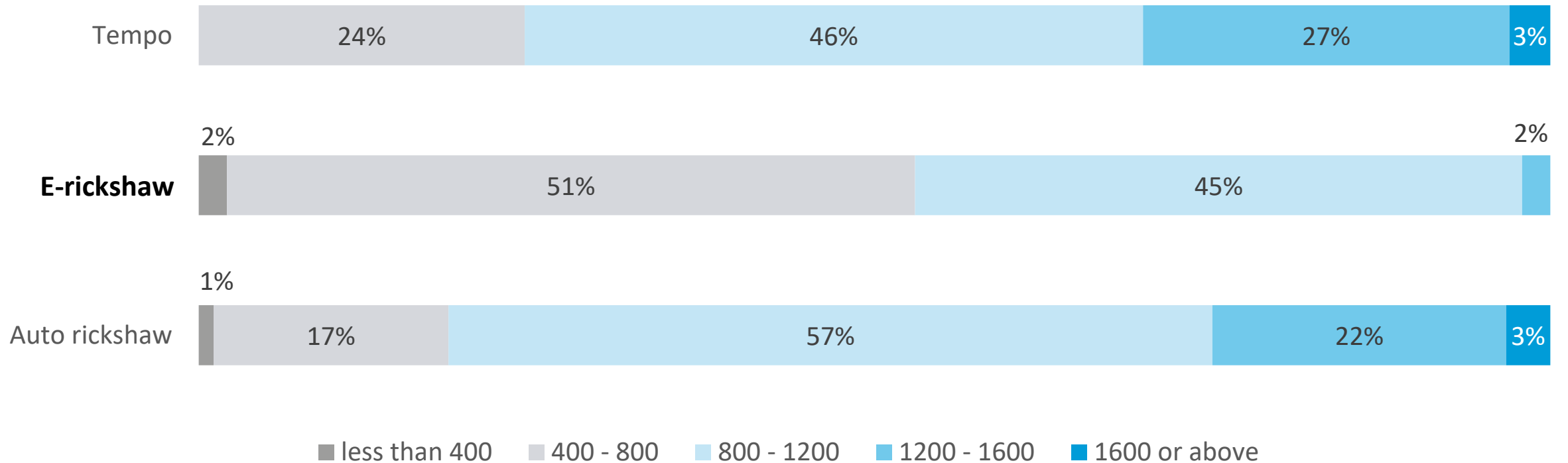
Average daily fuel cost (INR)



Only half of e-rickshaw drivers earn more than INR 800 per day

- 30% of tempo drivers earn INR 1200 or more a day as compared to 25% of auto-rickshaw drivers

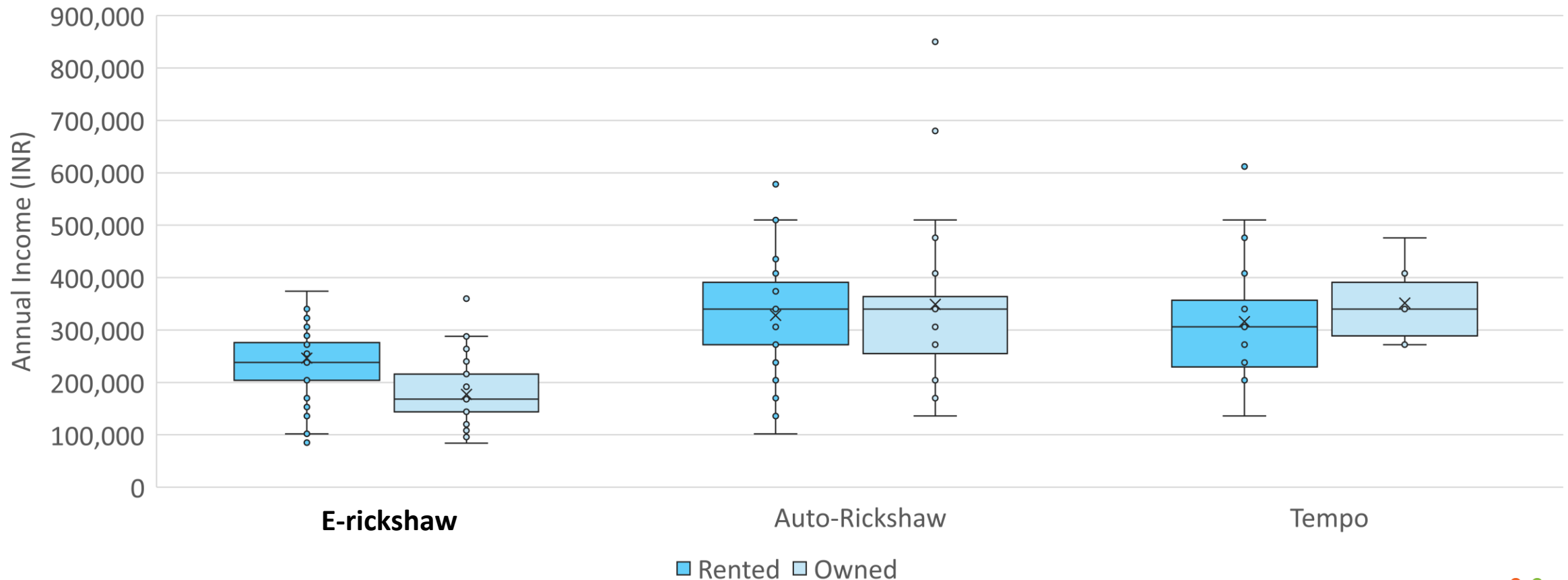
Daily revenue of IPT drivers (INR)



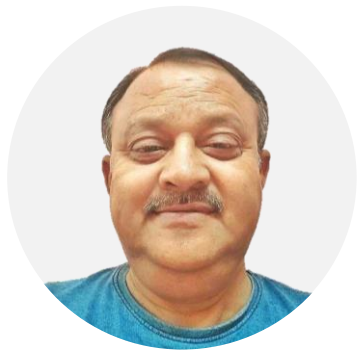
E-rickshaw drivers have the lowest annual income

- Drivers who rent e-rickshaw and auto-rickshaw earn more than drivers with who own vehicles
- Drivers who own tempos earn more than drivers who rent them

Annual income of IPTs based on ownership models (INR)



Stakeholder opinions from the survey

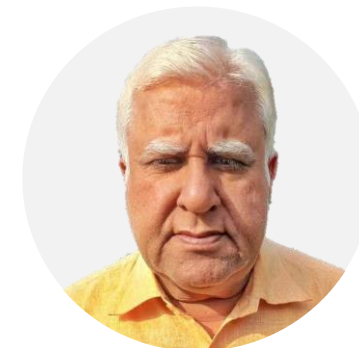


“Various vikram tempo owners want to shift to shared auto due to the flexibility to move easily in traffic and earn higher revenues. There is a need for proper infrastructure in form of the stands, stops, parking etc. designated for vikram tempo operators.”

- Rajesh Raj, Varishta Upadhyaksh, Tempo Taxi Mahasangh / Vikram Association

“I’m thinking of purchasing electric autos once the battery technology improves and a desired range of 150 km is provided. Charging stations must be set up by the government.”

- Jagdish Taneja, Autorickshaw & tempo fleet owner



“CNG autorickshaw drivers in Lucknow earn INR 7,000–12,000 per month, and they have to spend around INR 2,000 per month on maintenance. In the case of an electric vehicle transition, if autorickshaws come with swapping technology that costs less than point charging, we will welcome it.”

- Pankaj Dixit, President, Lucknow Auto Rickshaw Three Wheeler Sangh (LARTS)

References

1. Transport Department, Government of Uttar Pradesh, 2022.
2. India Smart City Mission. 2016. “The Smart City Challenge-Stage 2: Smart City Proposal-Lucknow” *Lucknow Smart City*. New Delhi: Ministry of Urban Development, Government of India. https://www.lucknowsmartcity.com/image_uploads/SCP_Lucknow.pdf.
3. Transport Department, Government of Uttar Pradesh, 2022.
4. Transport Department, Government of Uttar Pradesh, 2022.
5. Kumar, M., Seema Singh, Akshima T. Ghate, Sarbojit Pal and Sangeetha Ann Wilson. 2016. “Informal Public Transport Modes in India: A Case Study of Five City Regions” *IATSS Research* 39(2): 102–109. <https://doi.org/10.1016/j.iatssr.2016.01.001>.



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- Suggested citation:** Mall, Udit Narayan, Samradh Singh Chauhan, Nilanshu Ghosh and Himani Jain. 2023. *How does Intermediate Public Transport (IPT) system operate in Lucknow?* New Delhi: Council on Energy, Environment and Water.
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- Peer reviewers:** Dr Shalini Sinha, Center Head and Principal Researcher, Center of Excellence in Urban Transport (CoE-UT), CEPT Research and Development Foundation; Pawan Mulukutla, Program Director - Clean Mobility and Energy Tech, WRI India; Ravi Gadepalli, Consultant, World Bank; Karthik Ganesan, Fellow and Director- Research Coordination, CEEW and Sourav Dhar, Programme Lead, CEEW
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COUNCIL ON ENERGY, ENVIRONMENT AND WATER (CEEW)

ISID Campus, 4, Vasant Kunj Institutional Area
New Delhi - 110070, India

CEEW Lucknow - Project Office

5th Floor, TC/G-1/1, Vibhuti Khand, Gomti Nagar,
Lucknow Uttar Pradesh - 226010