



# Charge-on-the-move solutions for future mobility: A review of current and future prospects

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# Rise of future mobility



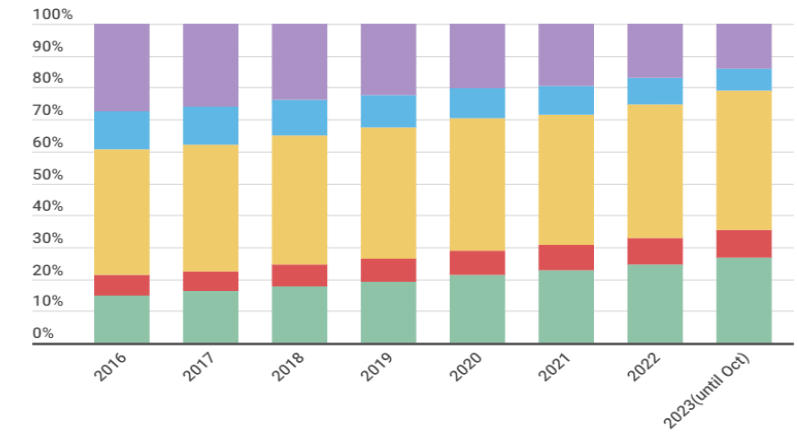
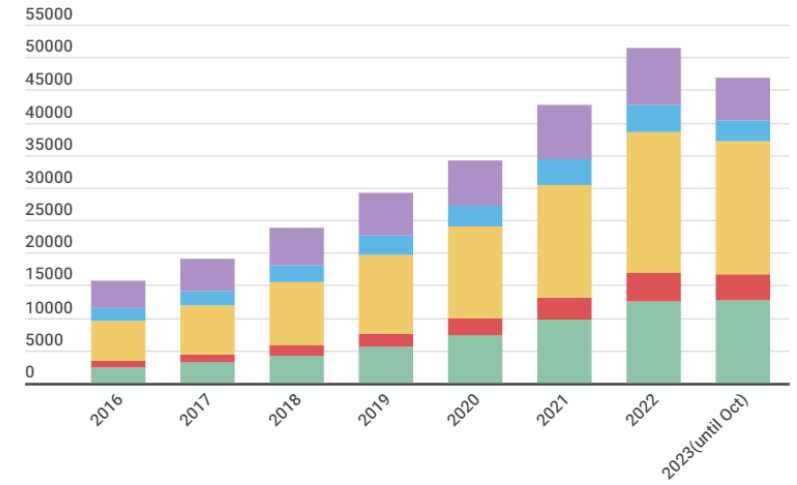
Figure - Illustrations of AVs and modular vehicle concepts [3][4][5]

- Lack of **human drivers** to make the physical connection.
- **High utilization, less idle time** for charging.
- Loss of **time** and **profit** from routing and queuing at charging stations [6].



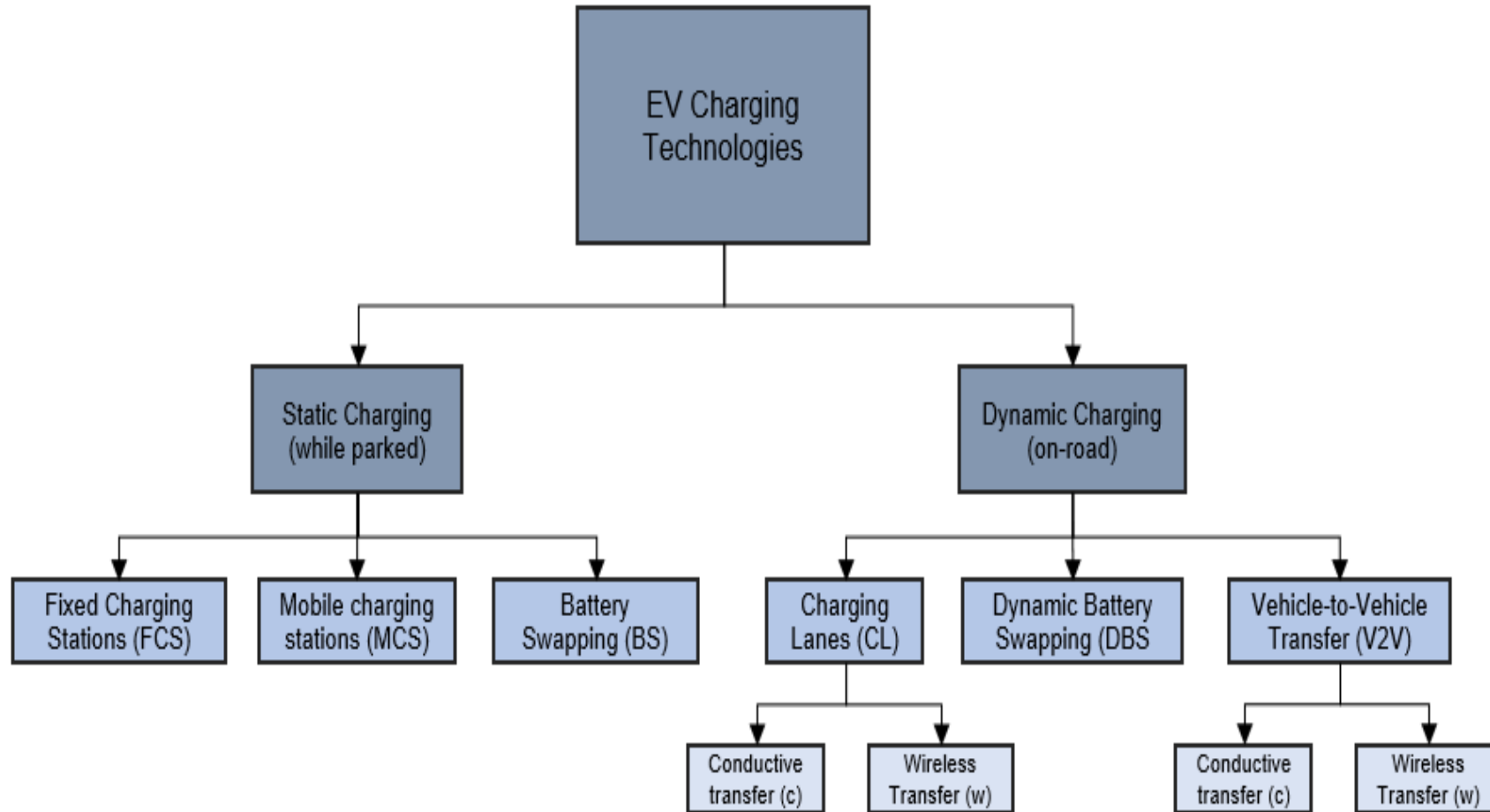
# Research Questions

- What are the **optimal charging methods** suitable for current and future of transportation like **AVs and shared mobility**?
- How do different charging methods compare with each other in terms of **flexibility** and **adaptability** to cater to new trends in transportation?



■ Fixed Charging 
 ■ Mobile Charging 
 ■ Charging Lanes 
 ■ Vehicle to Vehicle charging 
 ■ Battery swapping (stationary and dynamic)

# Charging Topology





## **Integration with AVs**

- Optimized routing and charging coordination
- Platooning and Charging
- Improved grid integration

## **Future research**

- Interoperability Standards
- Optimal Infrastructure Deployment
- Cybersecurity and Privacy
- Real world test pilots

# Selected References

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- [5] Engel, H., Hensley, R., Knupfer, S., and Sahdev, S. (2018) Charging Ahead: Electric-Vehicle Infrastructure, McKinsey Co., no. Exhibit 1, pp. 1–8.
- [6] M. Silverio, “How to make a vehicle, autonomous.,” Medium, <https://towardsdatascience.com/how-to-make-a-vehicle-autonomous-16edf164c30f> (accessed Oct. 15, 2023).