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Tradable mobility credits and permits: state of the art and future research directions

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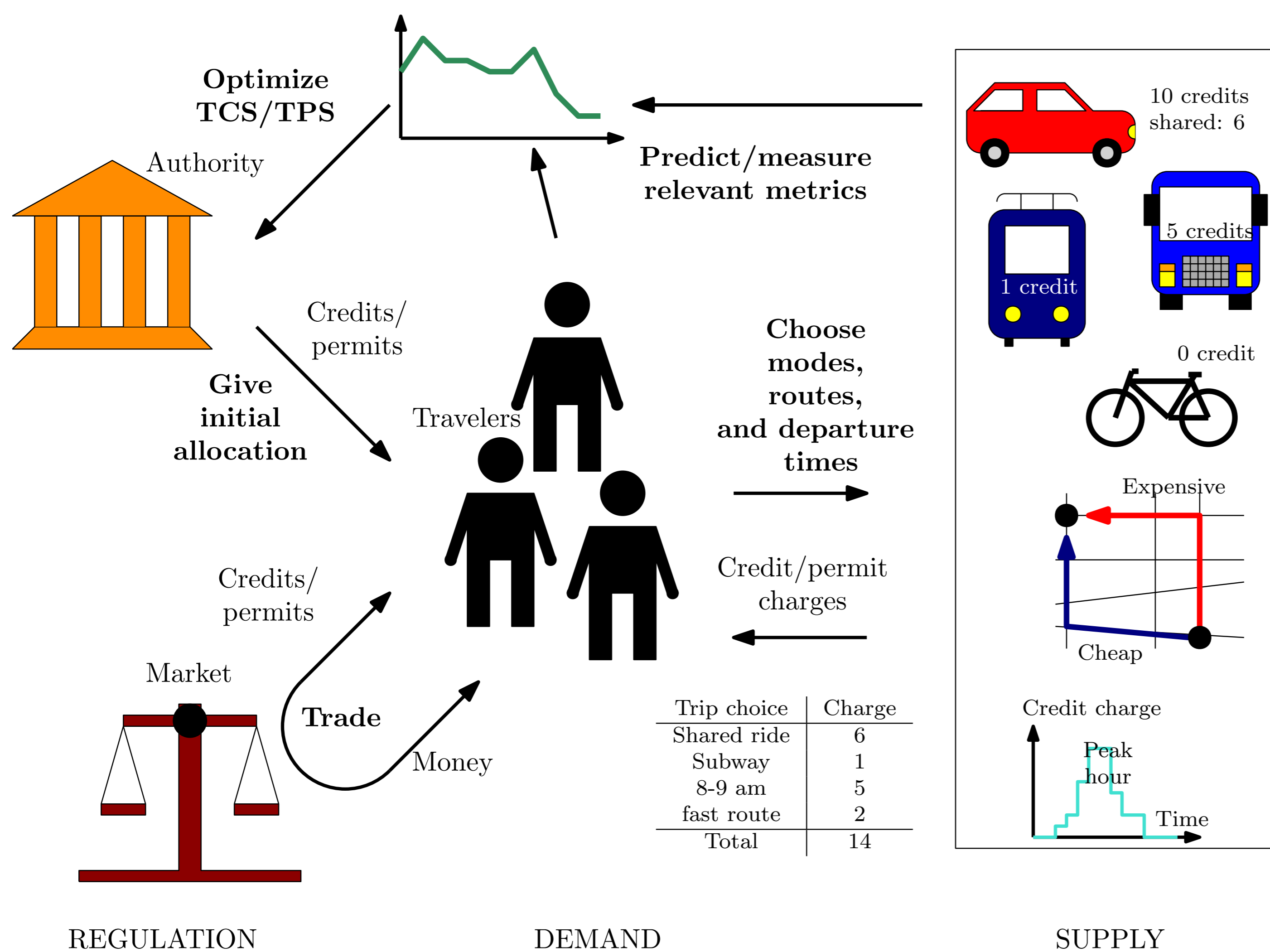
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Tradable mobility credits and permits: state of the art and future research directions



TCS and TPS from the literature

Objectives/KPI

- Reduce congestion
- Reduce pollution
- Ensure equity

Charging schemes

- Link
- Time
- Distance
- Area
- Class
- Vehicle
- Negative charge

Market settings

- Free initial allocation / auction
- Market clearing condition
- Regulator updates the price
- Double-auction market
- Transaction costs

Credits and permits

Urban mobility faces challenges to be more **sustainable** (pollution, congestion, equity). The redistribution of the travel demand in space, time, and transportation modes can improve the efficiency of the transportation network. **User equilibrium → System optimum**

Tradable Credit and Permit Schemes (TCS/TPS) are **quantity-based policies**: the regulator fixes the quantities, and the price is an outcome of the market. **Credits and permits** are commodities needed to access the transportation network.

The **credits** are **indifferentiable**, while **permits** are **specific** to a link and a timeslot.

Each travel alternative requires a given amount of credits (TCS) or a specific permit (TPS).

L. Balzer, J. Provoost, O. Cats, and L. Leclercq, *Tradable mobility credits and permits: state of the art and concepts*. Deliverable D4.1 in the project DIT4TraM (2021). <https://dit4tram.eu/downloads/>

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Limits and future research directions

Most contributions are based on Vickrey's bottleneck (fixed capacity and same trip length) and BPR function (no dynamics) to compute the travel times.

→ Use **Macroscopic Fundamental Diagram (MFD)** and **agent-based simulators**.

Most contributions deal with only car driving: changing routes and departure times. Some account for carpooling or transit riding but no on-demand services.

→ Investigate TCS/TPS to regulate **multimodal networks with on-demand services**.