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When Innovation Outpaces Regulation: Lessons from E-scooters for ITS and Automated Mobility

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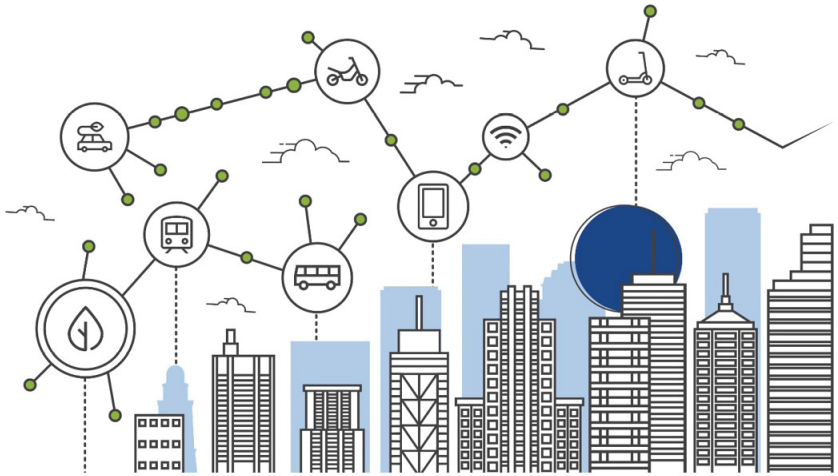

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Governing behavior we cannot predict

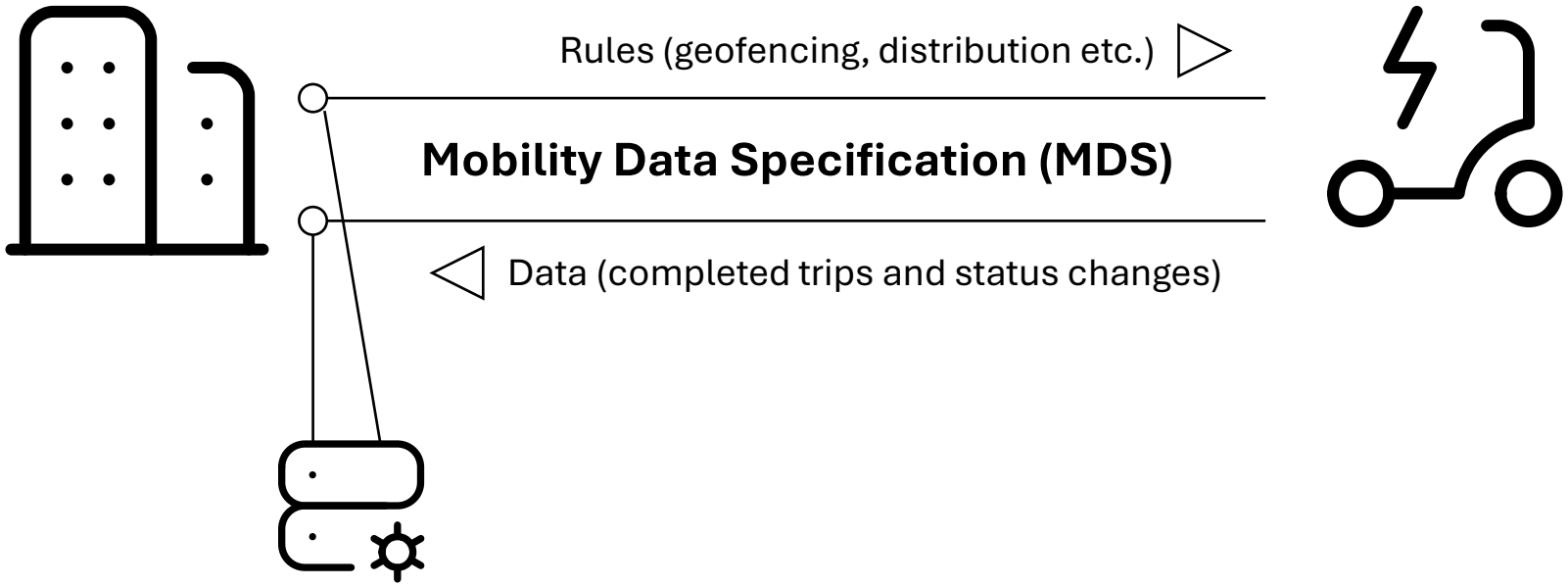
- New technology creates behaviour nobody planned for, so the rules cannot be fully written in advance
- The real question is how quickly we can fit new behaviour into the transport system
- The bicycle: the disruptive micromobility of the 1890s



Governing e-scooters through a new kind of ITS

Municipalities/cities

Operators



System support to express rules, monitor compliance, see travel patterns, etc. Developed in-house or procured (e.g. from Vianova, Populus, Blue Systems)

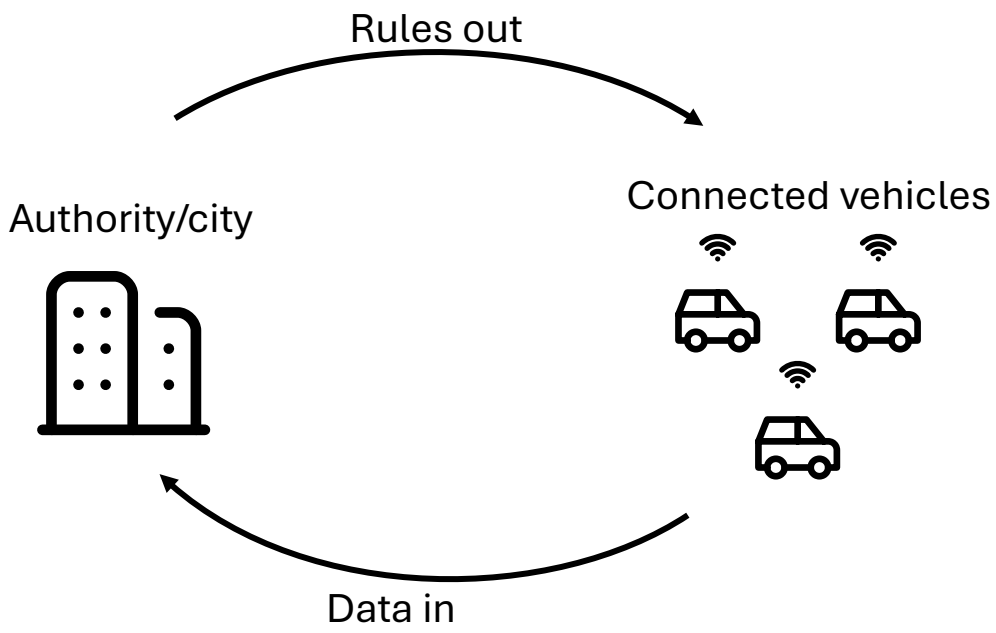
Rules that change in hours

- Traditional: signs and local regulations
  - Requires manual follow-up
  - Changes slowly through formal decisions
- Data-driven: the rule is drawn as a digital zone and sent to the vehicles (geofencing)
  - Compliance and effects are followed continuously in data
  - From complaint to updated rule in the vehicles: days, sometimes hours
- BUT: GPS data is not exact – how is the margin of error handled?



Fast rules need stable processes

- When rules change quickly, stability must come from elsewhere. Everyone must know:
  - Which rule applies to me, right now, at a specific place?
  - Who can change it, how, and with how much notice?
  - How is compliance judged when the data has errors?
- Cities in our study underestimated this – without answers, bans become the only tool left



Automated vehicles: the same pattern, higher stakes



What national initiatives can do now

- **Provide a legal basis for digital rules** – without a mandate, contracts become the only tool and bans the only way out. Finland has one; Sweden does not yet
- **Make the process transparent** – how compliance is judged (open algorithms), and when and how rules may change
- **Accept that the technology is not perfect** – agree tolerances for GPS error, data delays and how long operators have to adapt to new rules
- **System suppliers make many regulatory decisions in practice** – stay closely involved and put clear requirements in contracts

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Thank you for your attention!

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