Mobility as a Service: what does it mean?

From fixed carriers to virtual carriers

Eric Verhulst, CEO/CTO Altreonic NV
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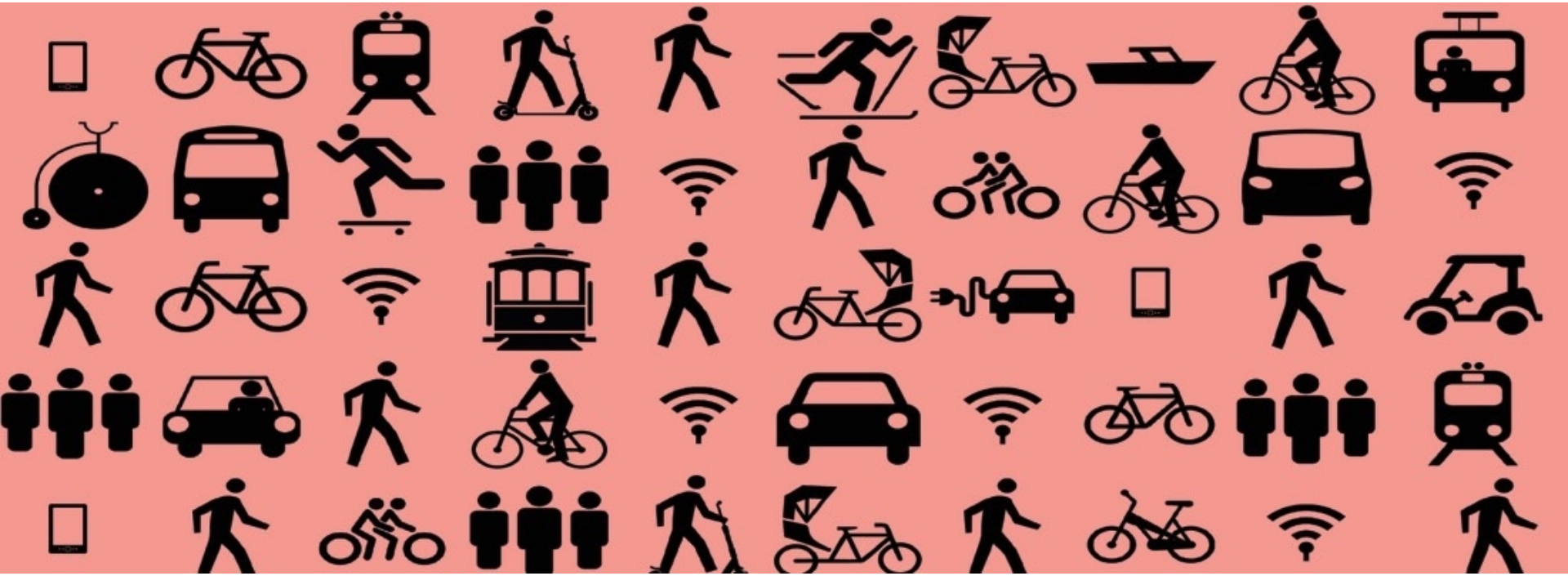
Mobility issues

- Small parcels, pallets, containers, … for goods
- Single person, families, masses ... for people
- Real MaaService need: point-to-point
- Space and time (+ energy) are resources
  - Density in space and time is the issue
  - Measured in mass&volume payload / m2 road @ speed
- Today:
  - Multi-modal, space and time inefficient
  - Connection points are bottlenecks
  - Multiple carriers needed

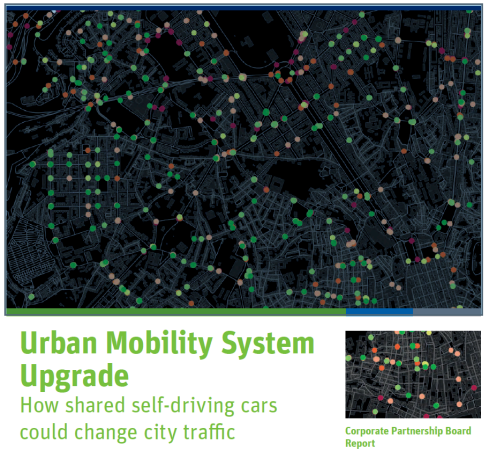
Is this the solution?



Connectivity is the issue

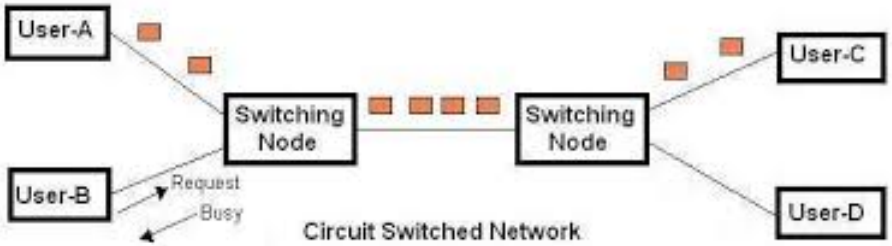
Or is this the solution?

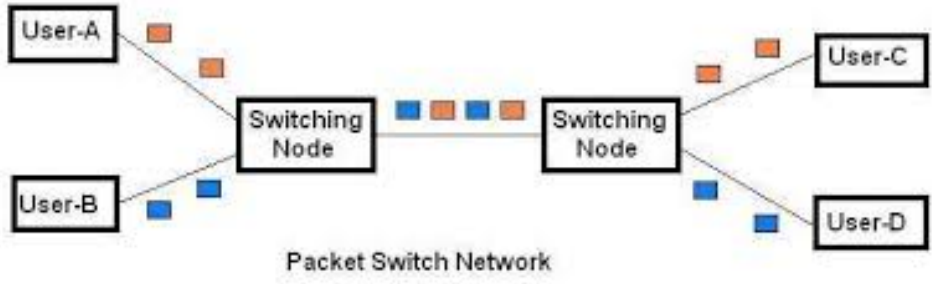
- No more cars/vans in city and replaced by TaxiBots ?
  - http://www.internationaltransportforum.org/cpb/projects/urban-mobility.html (OECD)
  - 90 % less vehicles, 80% less parking space needed
  - Mobility increases with up to 89% (in km)
  - Less air, heat, noise pollution
  - Enormous economic consequences: MaaS



What did telecom do?

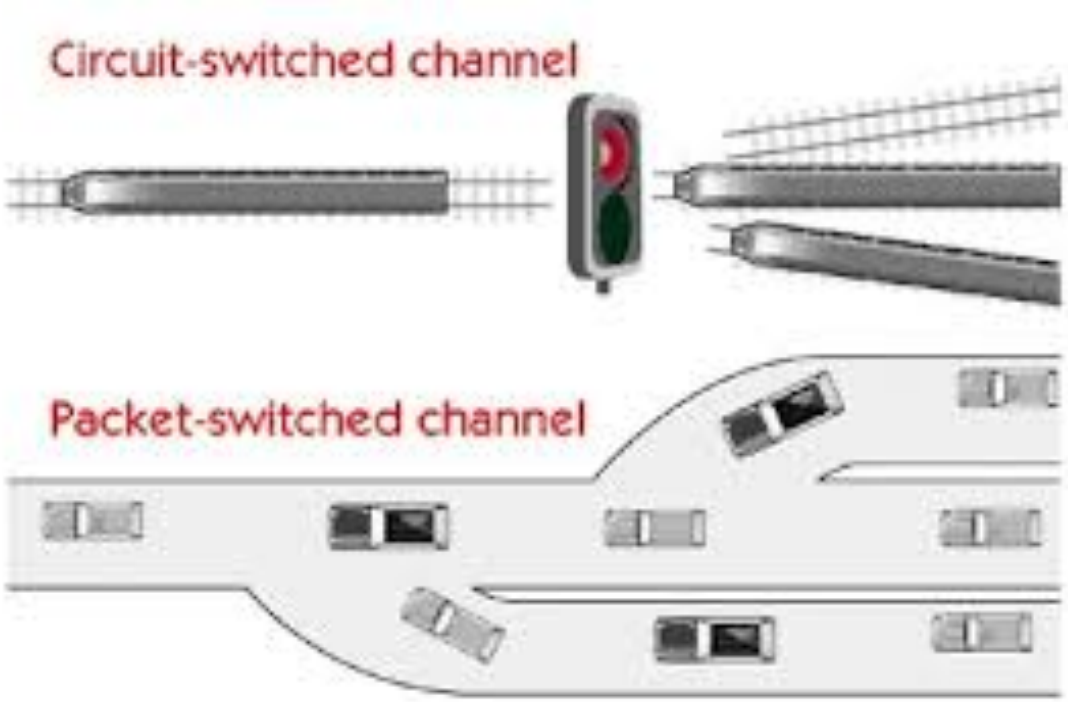
- Before: circuit switching = fixed physical paths
- Now: packet switching = virtual paths
  - Time and space partitioning
- Result:
  - Marginal cost of communication close to zero
  - Multi-service: voice, data, anywhere, anytime





Packet switching in mobility

- Moving mass, not bits
- Trains: circuit switching
- Roads and cars: packet switching ?
  - Half-way: car is underutilised



Objectives of MaaS

- Increase density in space and time
- Sustainable = Decrease use of resources
  - Free up space
  - Decrease pollution (air, heat, noise)
- Increase Quality of Service:
    - Move more in less time
    - More comfort
    - Flexibility
- Shall we go electric?

City mobility vs. open road

- City:
  - Less space available, dense infrastructure
  - Shorter distances traveled, lower average speed
  - More idle time (parking)
  - Density is more of a pollution issue
- Conclusion1:
  - An e-car for the road is not a e-car for the city
- Other issues:
  - How to bring the e-energy to the vehicles?

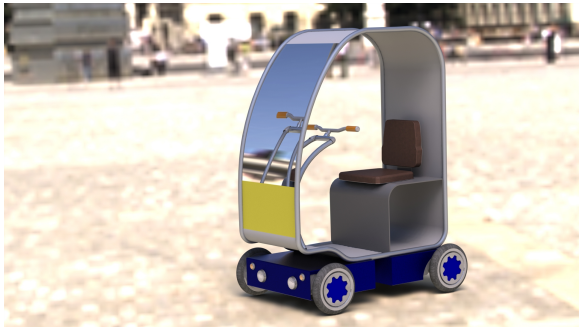
Solution approaches

1. **Cost/vehicle/ride sharing** schemes:
   - Reuse idle/empty capacity in time and space
   - Mix people and goods (parcels in the trunk)
   - Works with existing vehicles
2. Create **versatile** vehicle for urban mobility:
   - One example: KURT e-vehicle
   - Safety and cost benefit: (semi)-autonomous
   - No need for another Tesla
3. **Distribute the charging** infrastructure

1. Cost/ride/vehicle sharing

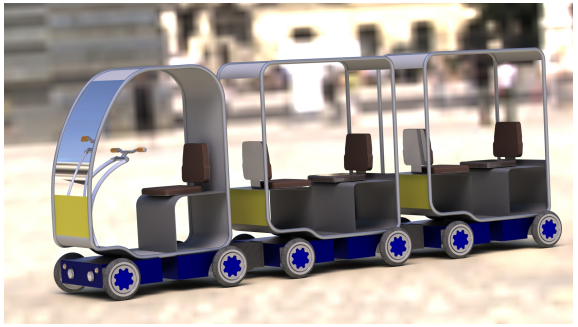
- Cost sharing = incentive
- Ride sharing = better use of capacity
- Vehicle sharing = better use of resources
- Results:
  - Saves money!
  - Low investment: App + marcom
  - Reduces traffic, congestion, pollution, …
  - Improves Quality of Life

2. Modular and scalable urban mobility: a versatile approach to deliver



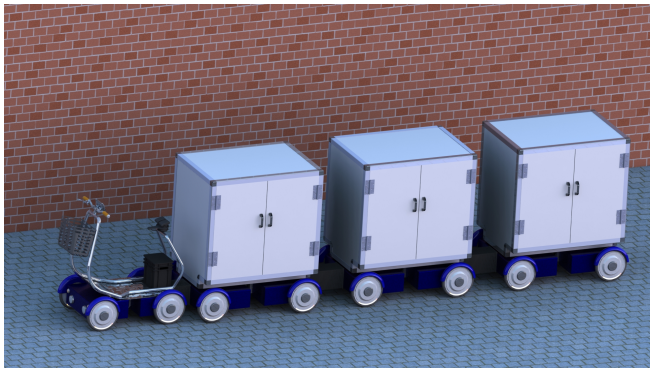
KURT-S-1P-90

KURT S-1P-90 + 1C-90



KURT-S-1P-90 + 2x 2P-90

KURT-M-1P-90-1C-90 -pallet



KURT-S 1P-78 + 3x 1C-90

KURT-M 4P-100

One standardised self-propelled platform + modular/scalable superstructure

3. Distributed charging

- Each KURT vehicle has:
  - Batteries to last a full day in city
  - A few KWh is enough (“Ceci n’est pas une Tesla”)
- Charging infrastructure already exists:
  - Each building has spare e-capacity
  - Often parking space in front or in garage
  - Slow charging during the night is OK
  - Fee for using the charging connector
- Complement with carports and solar panels?

The floor is yours

- Many initiatives are on-going
  - Is this a valuable roadmap?
  - Is this holistic enough?
  - Is this cost-efficient?
  - Is this realistic?
  - What else is needed?
- Motto: Keep It Simple but Smart!
- Feedback welcome