Shared Mobility Systems

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SHARED MOBILITY

Shared Mobility

Making better use of available resources

For a better quality of life


SHARED MOBILITY

- Transport is a discrete-event on-demand service.
- A traveller requests a resource, is allocated the resource, makes use of the resource, and releases the resource.
- Resources are vehicles, road connections and parking lots...and drivers
- Auto mobility costs money and the environment and therefore optimization of resources is desirable.


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Quality of Service

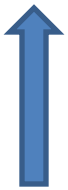
in

Discrete Event On-Demand Services

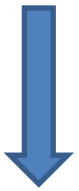
Trip Time

No parking available

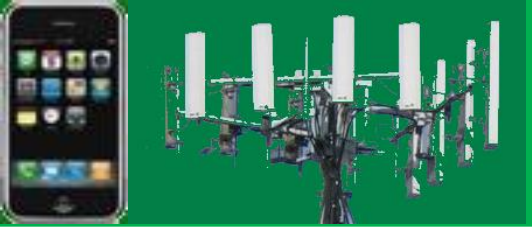
Waiting Time



Quality of Life for All



So we need to find an equilibrium



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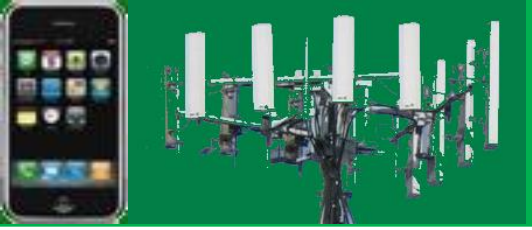
Shared mobility systems should lessen cars on the roads and not merely fill in 'EMPTY SEATS'

This leads to

- Less congestion
- Less CO_2
- Less parking bays required



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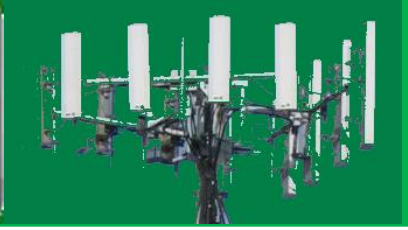
Three Types

- Private Taxi Share (Taxi Pooling)
- Private Car Pooling
- Private Car Share

Taxi Share – Dial-a-Ride

- Taxi is shared between independent passengers.
- Similar to PTS, but with flexible routes and timetables.
- Five star PTS.
- Taxi picks-up or drops-off passengers on the way.
- Taxi fleet and taxi drivers owned by a company.
- Promises a reduction of standard taxi fares to competing levels, comparable to the cost of owning and operating a private car.
- Can contribute significantly to a reduction in car ownership.



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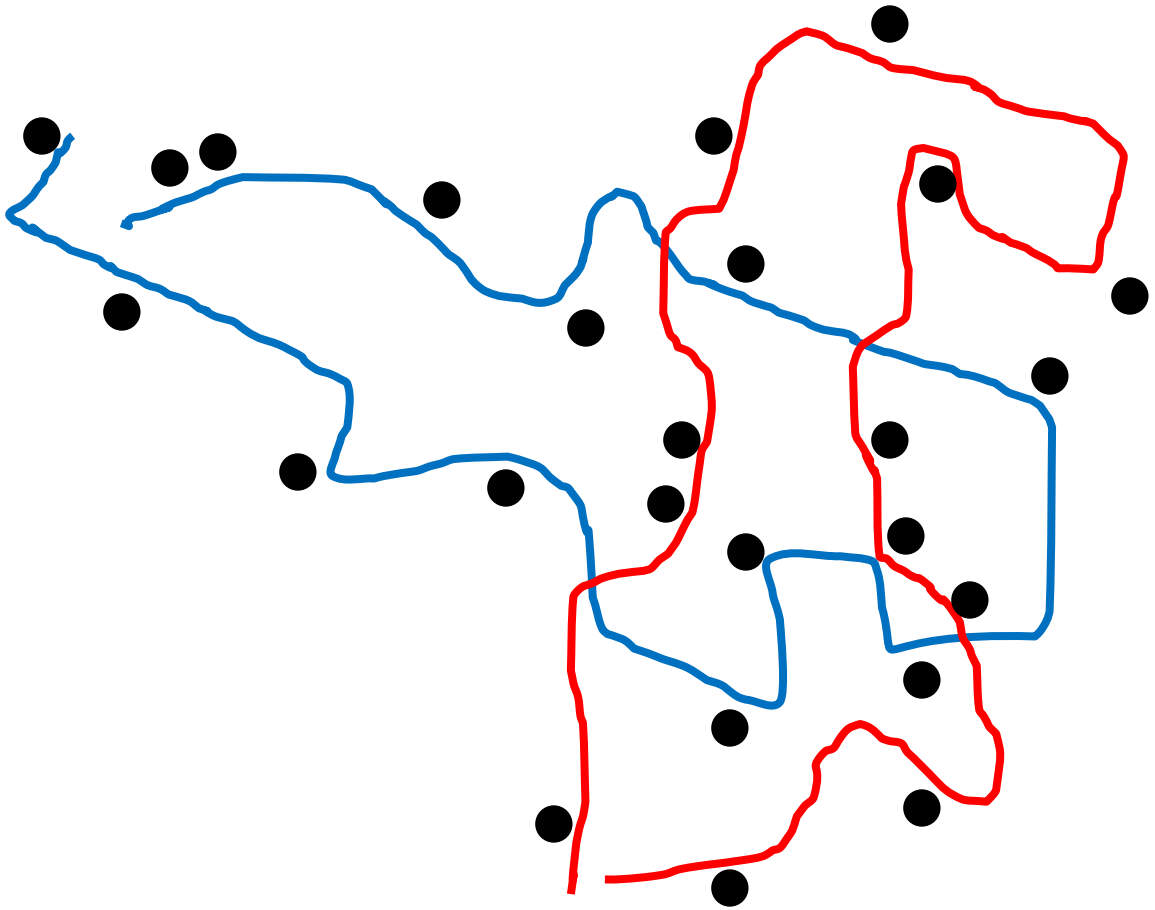
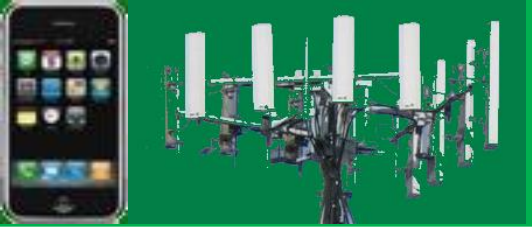


Routes are defined by the demand. So system is auto adaptive



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Dynamic Dial-a-Ride (Taxi share)

Mean cost per passenger is 1.45/1.90 Euro. (8/6 seat)

Promises a reduction of standard taxi fares to competing levels, comparable to the cost of owning and operating a private car.

Trip Length	2km	4km	6km	8km
Private car Fuel only	0.25	0.50	0.75	1.00
Private car	0.60	1.20	1.80	2.40
+ parking	2.00 - 9.00	2.00 - 9.00	2.00 - 9.00	2.00 - 9.00
DaRS 8 seat car	0.80	1.20	1.40	1.80


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Dynamic Taxi Share

- Requires full ICT infrastructure, including smart phones and micro-payment systems.
- Can run at high efficiencies and at relatively low-cost.
- Great for commuters with flexible hours


Static Taxi Share

- Static taxi share requires basic ICT infrastructure and human operator.
- Low efficiency and costly.
- Good to support other shared systems when disruptive events occur.
- Good for off-peak hours, to replace private car ownership, and provides accessibility to all.


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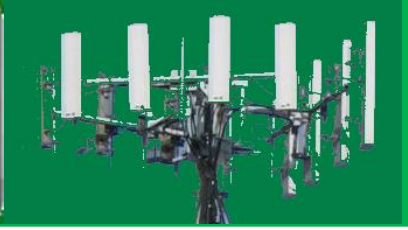
Car Pool

- In its simplest form...A group of private car owners share rides with similar ODs on an agreed roster basis....thus saving on fuel and parking costs, if any.
- Additionally relieves traffic and overall trip times.
- No Monetary transactions are carried out.



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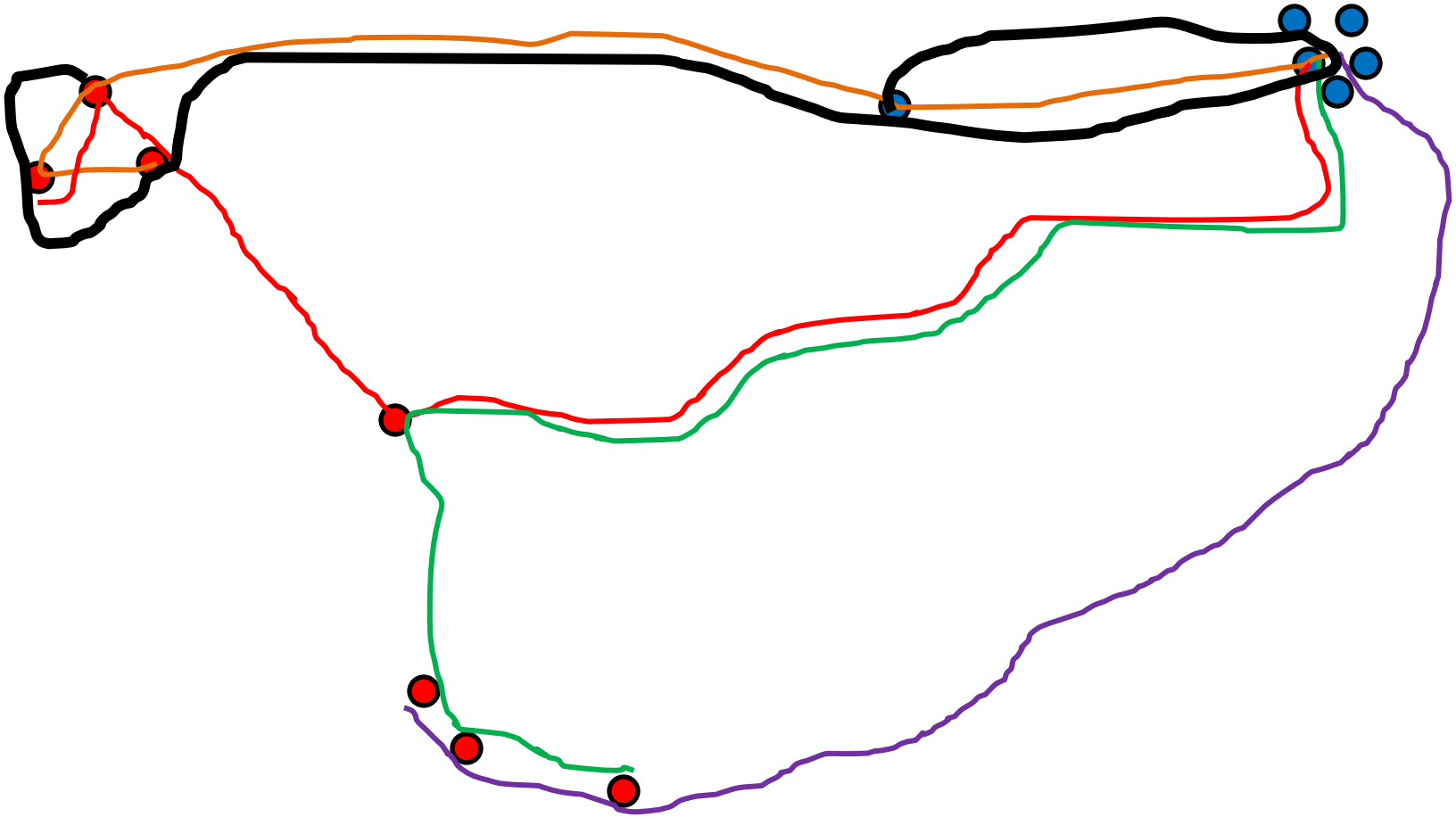

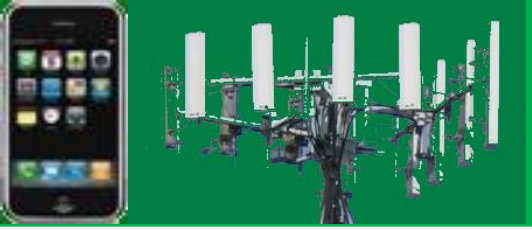

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Three classes

- Small group Car Pool
- Large Company Car Pool
- Public Car Pool

Gain


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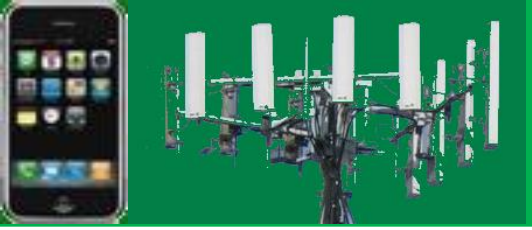
Technology

- Basic ICT – personal phone.
- Web Based
  - Peer-to-Peer
  - Pattern recognition
- Smart Phone and Wireless Communication Systems

Gain



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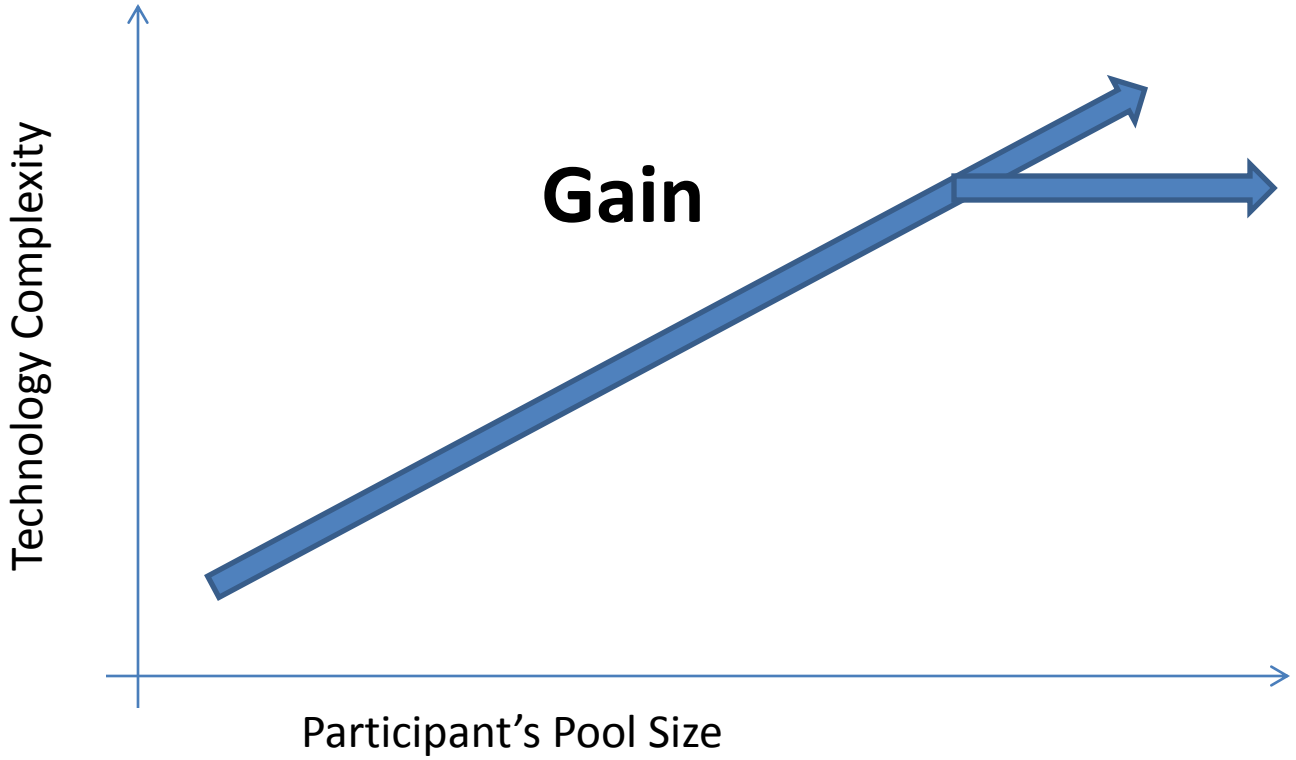


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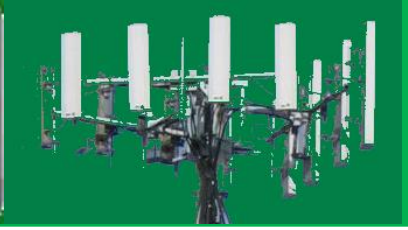
Problems inherent in car pooling

- Variability among participants in morning departure and evening leave.
  - Jobs characterized by a strict timetable
  - Large subscription to a car pool
  - Dynamic allocation algorithms with instant updates


Problems inherent in car pooling

- Most systems in place do not have a fair regulated system that keeps track of the roster such that costs are distributed.
  - Simple manual on-line log is a solution.
  - Advanced technology can automate the process

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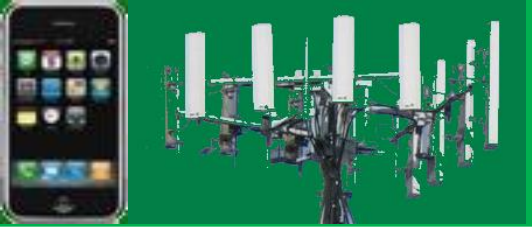
Problems inherent in car pooling

- Lack of Trust in Quality of Service or Experience
  - Some people are always late!
  - Some people do not wait!


Problems inherent in car pooling

- Legal and Fiscal Issues
  - Car Pooling is a peer-to-peer business model based on bartering….where overheads are kept to a minimum.
  - Bartering limits subscriptions to car owners.
  - Variability in OD undermines car pooling
  - To solve some inherent car pool problems a legal framework is required….unless payment is done with goods.
  - Current Businesses in Transport do not like car pooling



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Problems inherent in car pooling

- Security issues. Some participants might have bad intentions.
  - Is more likely to happen in mass car pooling
  - Requires constant screening of drivers and passengers
  - Variability
- Variability in cultural and habitual backgrounds


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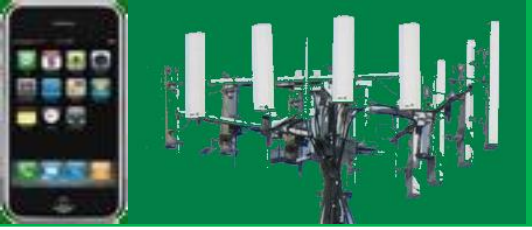
People may need an added incentive to join car pool

- Reward scheme or penalty scheme.
- A reward scheme may be difficult, from savings or from city council
- Penalty scheme is easier…parking charge



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Benefits

- One car instead of three/four on the road
  - Less congestion, less CO_2
- 60% savings on fuel and car park costs
- Increased socialisation and sharing
- Better quality of life


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Current-state-of-the-art in R&D

- Car pool is integrated with Taxi-share and legally regulated
  - Taxi share is a full-time backbone resource
  - Car-pool is a part time resource
  - Car-pool monetary / barter rewards
- Mass public subscription is necessary
- Real-Time on-demand service
- Basic access is via web-site
- Full-service is via smart phone app


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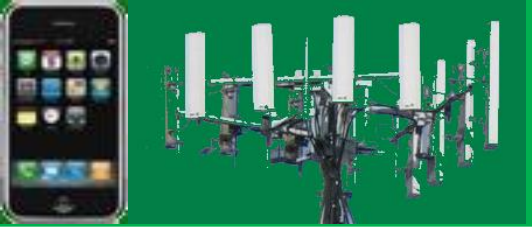
Minimum that can be Done

- Large company based car pool
- Study current travel patterns and predict post travel patterns
  - Some employees will adapt in exchange of a reward
- Set reasonable target
- Maintain on-line website with email notifications



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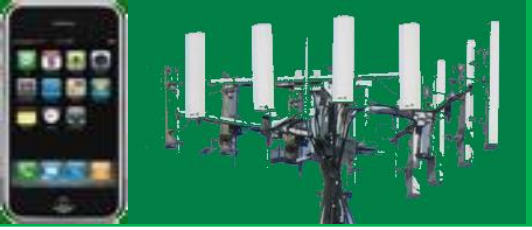
No of Employees using a private car = 1000

Employees opting for car pool = 600

Car occupancy (passengers)	Parking bays required		Fuel saved
1	600	-0%	0%
2	300	-30%	30%
3	200	-40%	55%
4	150	-45%	68%



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Minimum target =
share a ride once a week, and
offer a ride once a week

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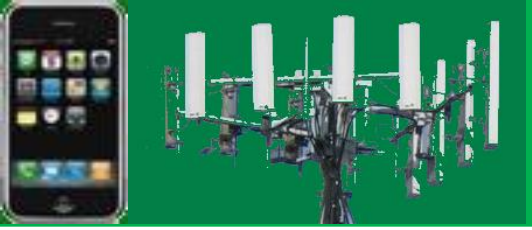
Thank You



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Car Share

- An alternative to full car ownership.
- Car ownership is divided among a number of owners.
- May reduce congestion and parking problems, but not CO_2
- Operated by a company, with part-owners contributing to fund car fleet.
- Dynamic and static versions – depending on ICT infrastructure.