PPT - Personalised Public Transport
- an automated, hybrid electric transport system offering the best of all worlds whilst saving this one

Capoco Design Limited
01 March 2006
Capoco is a bus design company
Formed in 1977, we have multiple bus and coach projects across the global markets in Europe, America, Asia and Africa
mobilicity

The project started as celebration of Capoco’s 25th, running from Oct 03 to Oct 04, at the Helen Hamlyn Research Centre of the RCA into the future of city transport in the year 2027.

Points to address included:

• population growth and rural-to-urban drift
• energy use, air quality and sustainability
• demographic trends and social inclusion
• social and commercial needs for direct interaction
• transport options to combat congestion
• commercial & technical realism
Research into City Journey and User Profiles

Polycentric city

Processes:
• Forecasting v Backcasting
• Extrapolation v Retropolation
PPT Concept

DRIVERLESS ROAD-BASED INTELLIGENT VEHICLE PLATOONING USING TELEMETRICS

MAX 6 UNITS

12 SEATS
18 SEATS
24 SEATS

3 SIZES
Vehicle Size Options - 2 to 200 passengers
Liquid Fuelling Infrastructure
Need to use the existing systems and avoid known EV problems of range, battery capacity & limited life
For Energy Flow or Power Output (510MW)
4 of these = 1 of these
Taxi – Friend or Foe?
Car based systems use too many vehicles

- 1.8 tonne diesel car
- average 1.5 passengers
- Driver does not count
- No need to park
- Poor on specific fuel use
- Poor on specific emissions
- 0.2% of fuel to move 1 passenger
PPT Concept – 2003 to 2004
PPT Design – 2004 to 2005
PPT Development – 2005 to 2006

mobilicity design team
Merih Kunur
Owen Evans
Rob Morton
Ron Saunders
## PPT Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>5.0m x 2.1m</td>
</tr>
<tr>
<td>Weight</td>
<td>2.7t to 4.5t</td>
</tr>
<tr>
<td>kW/t</td>
<td>8.88</td>
</tr>
<tr>
<td>Capacity</td>
<td>12 to 24</td>
</tr>
<tr>
<td>Power</td>
<td>40kW</td>
</tr>
<tr>
<td>Drive</td>
<td>Series Hybrid</td>
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</tbody>
</table>

![Image of PPT Characteristics](image-url)
## PPT Characteristics

<table>
<thead>
<tr>
<th>Engine 1</th>
<th>Bio-Diesel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine 2</td>
<td>H₂ ICE</td>
</tr>
<tr>
<td>Engine 3</td>
<td>H₂ Fuel Cell</td>
</tr>
<tr>
<td>Fuels</td>
<td>Bio-Diesel</td>
</tr>
<tr>
<td></td>
<td>SynD/G-t-L</td>
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<tr>
<td></td>
<td>H₂</td>
</tr>
<tr>
<td>Operation</td>
<td>Multi-mode</td>
</tr>
<tr>
<td>Speed</td>
<td>5 to 70kmh</td>
</tr>
<tr>
<td>Control</td>
<td>Automated</td>
</tr>
</tbody>
</table>

[Image of a futuristic vehicle]

[Diagram showing Venn diagram with SAFETY, MOBILITY, PRODUCTIVITY]

[Logo for capoco design]
PPT Hybrid Drive Options using Internal Combustion Engines (ICE) or Fuel Cell
Automatic operation – is it possible?

Driver:
• Contributes to 90% of all accidents
• Failing to avoid pedestrian impacts
• Contributes from 45 to 75% of operating costs
• Increasingly hard to employ in sufficient numbers
• Increasingly difficult to cover unsocial hours

Automation:
• Phased introduction
• Three modes - closed, exclusive lane, open network
• Flexibility of scheduling, routes & rosters
• This technology exists now!
Automatic operation – existing systems
Bus Rapid Transit (Indonesia, UK, USA, Korea)
Proven capability regarding road space and volume flow

3RT passengers beat Jakarta's traffic jams.
City car v PPT vehicle

smart:
2.5m long
2 people
0.8pass/m

PPT:
5.0m long
12 seated
12 standee
4.8pass/m
Traffic flows

- Smart cars
- PPT's 12 seat, solo operation
- PPT's 24 pass, 6 unit platoon operation

All at 50% of 'Highway Code' braking distance
Lane density

Lane density - passengers per metre

- 6 x Mobilicity
- 1 x Mobilicity
- Smart Car
Capacity

Lane capacity - passengers per hour per direction

Passengers per hour, 1000's

Kilometres per hour

6 x Mobilicity
1 x Mobilicity
Smart Car
Road Space Comparisons

Car type v Bus type v Tram/Platoon type systems
Same number of people (150) in each view
*mobilicity* allows high capacity AND cycle paths
AND wider pavements for pedestrians
Powertrain Options
(for low volume, heavy duty applications)

- Currently, the vehicle first cost is not a dominant factor and represents about 5 to 10% of total operating costs

- new advanced power units, notably fuel cells, are going to increase markedly the impact of this first cost effect

- the taxi approach, the fuel cell first cost is 225% of driver cost; automation would not cover the fuel cell unit first cost

- the PPT approach, due to the power unit’s low rating, the fuel cell amounts to only 74% of driver costs

- an automated PPT, using even today’s high fuel cell costs, would deliver a responsive, silent and affordable public transport system and emit only water
mobilicity PPT system:

- High passenger capacity to suit the busiest city areas
- High elasticity of supply linked to customer demand
- Improved service in frequency, route and response
- 50% reduction in operating energy re existing buses
- 50% reduction in operating costs re existing buses
- Based on existing road-way and fuelling infrastructure
- Ready for future H2 fuel supply and also fuel cell era
Program

- **Stage 0** – First two years research with the Helen Hamlyn Research Centre, InnovationRCA plus 10 collaborating partners
- Seminars London Oct 05, Bologna Nov 05, Detroit Show Jan 06
- **Stage 1** – Third year research plus seeking additional technical and commercial partners to complete the project consortium
- **Stage 2** – Fourth year prototype assembly of 2 vehicles and proving-ground testing
- **Stage 3** – Fifth year trial operation of demo ‘seed’ vehicles in pilot operation
Program

Current Partners Scope:

• Vehicle Design
• Project Incubation
• Communication
• Promotion
• Vehicle Technology
• Transport Planning
• Automotive Research

mobilicity partners
Automotive PR Limited www.automotivepr.com
Capoco Design Limited www.capoco.co.uk
Centre for Automotive Industry Research www.cardiff.ac.uk
InnovationRCA www.innovation.rca.ac.uk
Michelin Tyre plc www.michelin.co.uk
Pilkington Automotive Limited www.pilkington.com
Spirit Advertising Limited www.spiritads.com
Program

New Collaborative Partners:
• System Suppliers
• Infrastructure
• Operators
• Commercial
• Research

New Funding partners:
• Investors
• Research Bodies
• Governmental Agencies
• Industrial Companies
• Commercial Sponsors