Space and data allowing the integration of the transport system and the personalisation of the transport products

Maria Kamargianni
Lecturer in Transport & Energy, Head of MaaS Lab
MaaS Lab, Energy Institute, UCL
www.maaslab.org

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In the past, priority was allocated on building transport infrastructure and especially on increasing road capacity.

- Transport infrastructure is necessary.
- Resulting in an increase in car-ownership and vehicles on the road network.
More recently, one of the priorities is the expansion of the public transport system.

- Public transport systems should have an extensive coverage.
- However, sometimes, demand does not respond to the supply.
- Public transport system is highly subsidized by the public sector.
- Challenges with first and last mile trips.
- Inconsistent time tables, different tickets, different pricing.
“Transport has been hit by a DIGITAL TSUNAMI” (Sami Pipuri, 2016)
New Mobility Technologies

• Improved Internal Combustion Engines
• Electrification
• Vehicle to Grid (V2G)
• Connectedness
• Autonomous vehicles
• Flying vehicles
• Data processing
New Mobility Technologies

- Improved Internal Combustion Engines
- Electrification
- Vehicle to Grid (V2G)
- Connectedness
- Autonomous Vehicles
- Flying vehicles
- Data processing
- Smartphones
Multi-directional communication between users & suppliers

Ability to process big data

Real-time information

Apps allowing for one-stop-shop for planning, booking, payment, billing

Changing travel habits and transport mix
Millennials have been “bathed in bits and bytes” since birth

Consistent downward trend in the percentage of young people owning a driving license

Changing expectations toward individualization and sustainability

...from ownership to usership

Why are we still trying to solve our 21st century transport problems using 19th & 20th century inventions with a little help from IT and?
How do Londoners travel?
3.2 trips per day

48% of the trips consist of one stage

Over 50% have more than one stage

Data source: London Travel Demand Survey (LTDS), 2005-2017
Transport Mode

Car is the most popular mode

... Shift away from cars

Data source: London Travel Demand Survey (LTDS), 2005-2017
Distance of Stages by Mode

Car is the predominant mode for trips <1km.

North East & Central London: trips <2km.
Intermodal Trips

- Taxi
- Rail
- UG, OG, DLR, ...
- Bus
- Car Passenger
- Car Driver
- Cycle
- Walk

- Only one mode (including access and egress if walking)
- More than one mode

Rail & Tube => intermodal trips
Integrated infrastructure

Central London: everything is there
Integrated infrastructure

Zone 2: almost everything is there
## Car Substitution

<table>
<thead>
<tr>
<th>Main mode</th>
<th>Total cases</th>
<th>If alternative mode were:</th>
<th>% of cost saving cases</th>
<th>Average cost saving per trip (£)</th>
<th>% of time saving cases</th>
<th>Average time saving per trip (minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Car</strong></td>
<td>14,784</td>
<td>Bus</td>
<td>24%</td>
<td>0.68</td>
<td>28%</td>
<td>6.32</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tube</td>
<td>3%</td>
<td>2</td>
<td>81%</td>
<td>8.28</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rail</td>
<td>3%</td>
<td>2.04</td>
<td>94%</td>
<td>10.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Taxi</td>
<td>2%</td>
<td>1.38</td>
<td>63%</td>
<td>7.16</td>
</tr>
<tr>
<td><strong>Stages by car</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Car</strong></td>
<td>556</td>
<td>Bus</td>
<td>38%</td>
<td>5.22</td>
<td>28%</td>
<td>15.07</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tube</td>
<td>18%</td>
<td>8.16</td>
<td>79%</td>
<td>16.21</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rail</td>
<td>18%</td>
<td>6.68</td>
<td>96%</td>
<td>18.41</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Taxi</td>
<td>12%</td>
<td>3.71</td>
<td>62%</td>
<td>14.6</td>
</tr>
</tbody>
</table>

### Stages that either origin or destination are within Zone 1

- **Bus**: Savings: £104.4, and 5h / month
- **Tube**: Savings: £163.2, and 5h 24min / month
- **Taxi**: Savings: 14.6/trips

**Zone 1** - Substitute car with =
we need a ...

**QUANTUM leap in technology,**

and

**a paradigm shift in thinking**
Quantum Leap in Technology ...

London is there
A Paradigm Shift in Thinking ...

London is almost there
Travelling without using a private car...

Each Transport or Mobility Service provider operates in SILO
Rethinking mobility …

“Mobility as a Service”
The MaaS Concept
The MaaS Concept

The MaaS Concept

Current Situation           MaaS model

Urban Trips

MaaS Provider

Intercity Trips

City X

City Y

The definition of MaaS

“Mobility-as-a-Service (Maas) is a user-centric, intelligent mobility management and distribution system, in which an integrator brings together offerings of multiple mobility service providers, and provides end-users access to them through a digital interface, allowing them to seamlessly plan and pay for mobility.”

# Data & APIs

**MSPs data & Data Providers**
- Fixed routes
- Flexible routes
- Real-time vehicle positioning
- Real-time network conditions & disruptions
- Ticketing
- Journey booking
- Journey payment and ticketing

**Extra data**
- Land use & places data
- Weather
- ...
Personalised MaaS products
Mobility packages ... Like mobile phone packages

### Monthly Plans

**Price** | **Anytime Minutes** | **Anytime Minutes & Weekends**
--- | --- | ---
$29<sup>90</sup> | 300 | 1000
$39<sup>90</sup> | 400 | Unlimited
$49<sup>90</sup> | Totally Unlimited Calling

**ADD Text, Pix, Email, & IM**

<table>
<thead>
<tr>
<th>Price/ Month</th>
<th>Messages</th>
</tr>
</thead>
<tbody>
<tr>
<td>$5</td>
<td>1000</td>
</tr>
<tr>
<td>$10</td>
<td>Unlimited</td>
</tr>
</tbody>
</table>

**ADD Mobile Web Access**

<table>
<thead>
<tr>
<th>Price/ Month</th>
<th>Web Access</th>
</tr>
</thead>
<tbody>
<tr>
<td>$5</td>
<td>20MB</td>
</tr>
<tr>
<td>$10</td>
<td>50MB</td>
</tr>
</tbody>
</table>

### Pay As You Go Plan

**Price** | **Anytime Minute Packs** | **Roll Forward Minutes**
--- | --- | ---
$20 | 200 | Yes
$30 | 400 | Yes
$50 | 1000 | Yes

**ADD Text, Pix, Email, & IM**

<table>
<thead>
<tr>
<th>Price</th>
<th>Texts &amp; Messages</th>
</tr>
</thead>
<tbody>
<tr>
<td>$5</td>
<td>200</td>
</tr>
<tr>
<td>$10</td>
<td>1000</td>
</tr>
<tr>
<td>$20</td>
<td>Unlimited</td>
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</tr>
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<td>$10</td>
<td>20MB</td>
</tr>
<tr>
<td>$20</td>
<td>50MB</td>
</tr>
</tbody>
</table>

### Texter's Delight Plans

**Price** | **Texts & Minutes (not included)** | **Anytime Minutes**
--- | --- | ---
$14<sup>90</sup> | 1000 | Additional 10¢/min.
$19<sup>90</sup> | Unlimited | Additional 10¢/min.

**ADD Mobile Web Access**

<table>
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<th>Web Access</th>
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</thead>
<tbody>
<tr>
<td>$5</td>
<td>20MB</td>
</tr>
<tr>
<td>$10</td>
<td>50MB</td>
</tr>
</tbody>
</table>

### International Rates

**Calling to Over 200 Countries**

- Puerto Rico and U.S. Virgin Islands — no extra charge
- Mexico landline (Mexico City, Guadalajara, Monterrey, Puebla) — 2¢/min.
- Mexico landline (other cities) — 5¢/min.
- Mexico mobile — 20¢/min.
- El Salvador and Guatemala — 10¢/min.

**International Text Messaging**

20¢ each to send / 10¢ each to receive

Standard Anytime Charges Also Apply. For the latest International Rates, visit [www.halo.com](http://www.halo.com).
Mobility packages ... Like TV & broadband packages

**Starter Bundle** TV, broadband & calls
- Sky Entertainment
- Sky Broadband Lite
- Sky Talk Weekends
- Free Sky+ box, free standard set-up
- Free Sky wireless ‘N’ router

Get this bundle
- £21.50 a month
- Sky Line Rental £14.50 a month

**TV with Unlimited Broadband & Calls** Great entertainment and unlimited broadband & calls
- Sky Entertainment
- Sky Broadband Unlimited
- Sky Talk Anytime
- Free Sky+ box, free standard set-up
- Free Sky wireless ‘N’ router

Get this bundle
- £34 a month
- Sky Line Rental £14.50 a month

**Sports Unlimited** Live sports and unlimited broadband
- Live sports
- Sky Broadband
- Sky Talk

Get this bundle
- £50 a month
- Sky Line Rental £14.50 a month
## MaaS Products – Mobility plans

<table>
<thead>
<tr>
<th>Example</th>
<th>Pay as you Go</th>
<th>Whim Everyday</th>
<th>Whim Unlimited</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monthly payment</td>
<td>£0</td>
<td>£99</td>
<td>£349</td>
</tr>
<tr>
<td>Public transport</td>
<td>Pay as you Go</td>
<td>Unlimited</td>
<td>Unlimited</td>
</tr>
<tr>
<td>Taxi</td>
<td>Pay as you Go</td>
<td>Pay per ride</td>
<td>Unlimited</td>
</tr>
<tr>
<td>Car</td>
<td>Pay as you Go</td>
<td>Max £49/day</td>
<td>Unlimited</td>
</tr>
<tr>
<td>Bike share</td>
<td>Coming soon!</td>
<td>Coming soon!</td>
<td>Coming soon!</td>
</tr>
<tr>
<td>Cancel anytime</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Signup possible</td>
<td>Now</td>
<td>April 5th</td>
<td>April 5th</td>
</tr>
</tbody>
</table>

Source: [https://whimapp.com/uk/](https://whimapp.com/uk/)
Student package for £180/month
- Unlimited public transport in pre-specified zones
- 10 km P2P taxi
- 20 km ride share
- Unlimited bike-sharing

Eco package for £350/month
- 6 return trips-national rail within Greater London
- Unlimited public transport
- Unlimited bike-sharing
- 30 hours car-sharing

Save-package for £300/month
- 40 one-way trips by bus
- 40 one-way trips by tube (metro)
- 20 hours bike-sharing
- 6 hours car-sharing

Luxury package for £600/month
- 20 hours car-sharing (luxury car)
- 40 hours P2P taxi-luxury / or black cab
- 20 return trips national rail - First class
- Unlimited bike sharing

Family package for £1000 /month
- Unlimited public transport in pre-specified zone
- 5 hours/day car sharing
- 4 days car rental
- 40 hours P2P taxi
- Unlimited bike sharing for whole family

Subscription - Core/Entry package:
- Journey planner
- Easy to use booking system for car sharing, ride sharing, taxi, car rental
- Real time information - proposing different modes while user is on way
- Integrated payment (Package: pay once per month; PAYG: Deposit anytime to the registered account, “Use now & pay later” could be allowed with no penalty for up to 48 hours after using the service)

Pay-as-you-Go
Personalised MaaS plans

Individual mobility patterns

- Mobility tool ownership
- Current mode usage

Socioeconomic status

- Age
- Work status
- Gender
- Family status
- Disability

Attitudes and Perceptions

- Lifestyle
- Environmental consciousness
## MaaS Impact Evaluation

<table>
<thead>
<tr>
<th>Contribution of MaaS-London</th>
<th>Level of Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Save costs</td>
<td>High impact</td>
</tr>
<tr>
<td>Reduce journey time</td>
<td>High impact</td>
</tr>
<tr>
<td>Improve dissemination and provide real time information</td>
<td>High impact</td>
</tr>
<tr>
<td>Improve service experience for the transport user</td>
<td>Medium impact</td>
</tr>
<tr>
<td>Provide better connectivity</td>
<td>Low impact</td>
</tr>
<tr>
<td>Reduce traffic jams</td>
<td>Medium impact</td>
</tr>
<tr>
<td>Reduce transport pollution</td>
<td>Low impact</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Contribution to MTS’ proposal</th>
<th>Level of Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improving interchanges</td>
<td>High impact</td>
</tr>
<tr>
<td>Better information</td>
<td>High impact</td>
</tr>
<tr>
<td>Improved access to transport system</td>
<td>Medium impact</td>
</tr>
<tr>
<td>Smoothing traffic flow</td>
<td>Medium impact</td>
</tr>
<tr>
<td>Better streets and environment</td>
<td>Low impact</td>
</tr>
</tbody>
</table>
MaaS Maturity Index

- The index calculator

MaaS Maturity Index

- Transport operators: 10 criteria for each MSP
- Transport services and infrastructure: 4 criteria
- ICT infrastructure: 4 criteria
- Citizens: 5 criteria
- Policy, regulation and legislation: 7 criteria

You can find more information at: https://www.maaslab.org/maasindex
Examples of work

- Greater Manchester
- Luxembourg-Germany
- Budapest

You can find more information at: https://www.maaslab.org/projects-2