Autonomous Vehicles in MaaS Applications

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ITE San Diego Section
2017 Annual Meeting & Conference
June 20, 2017

The Problem

Source: King County Auditor
### AUTOMATED VEHICLES IN MaaS APPLICATIONS

#### The Problem

Increasingly, affordable urban housing is located away from the city center and public transit.

#### Evolution of MaaS

**Early 2000s** - Basic trip planners using static schedules and limited real-time information

**2010s – Current:** Regional trip planners with real-time information and service alerts

**Near Future:** Integrated MaaS apps with multimodal, accessible trips door-to-door, integration with AVs to streamline availability and cost savings.
Automated Vehicles in MaaS Applications

TriMet Open Trip Planner Shared Use Mobility (OTP SUM)

• Builds on TriMet’s OTP work started in 2009
• FTA MOD Sandbox Grant awarded for 2017-2019
• Consortium of 20 public and private agencies and companies
• Currently midway through development

Strategy
Use open source software, open data, and open standards to facilitate wide adoption.

Approach
Solve last mile problem through technology, innovation and collaboration.

• OpenTripPlanner (OTP) - Extend code to incorporate SUM modes, real-time info, enhanced accessibility narrative.
• Open Mapzen Pelias Geocoder - Extend functionality for govt agencies, and improve match rate.
• Open Data - Improve OpenAddresses and OpenStreetMap (OSM) in support of comprehensive trip planning and geocoding.
• Integrated Payment Plan

Source: TriMet

TriMet.org/MOD
• Horizon 2020 provides nearly €80 billion of funding over 7 years (2014 to 2020) for research and innovation
• Like OPT SUM, it is developed on open-source platforms
• 26 partners in 10 test sites (Brussels, Brescia, Canton Ticino, Edinburgh, Lazio, Ljubljana, Luxembourg, Skopje, Turin, Zagreb)
• 2/3 of the way through development, starting test runs
• socialcar-project.eu

Public transport + carpooling + social media = SocialCar
When are they coming?

<table>
<thead>
<tr>
<th>Year</th>
<th>Level</th>
<th>Automation Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>L1</td>
<td>ASSISTED</td>
</tr>
<tr>
<td>2010</td>
<td>L2</td>
<td>ADAPTIVE CRUISE CONTROL, AUTONOMOUS BRAKING</td>
</tr>
<tr>
<td>2020</td>
<td>L3</td>
<td>PARTIAL AUTONOMY</td>
</tr>
<tr>
<td>2020</td>
<td>L4</td>
<td>CONDITIONAL AUTOMATION</td>
</tr>
<tr>
<td>2030</td>
<td>L5</td>
<td>HIGH AUTOMATION</td>
</tr>
<tr>
<td>2040</td>
<td>L5</td>
<td>FULL AUTOMATION</td>
</tr>
</tbody>
</table>

Sources: IIS, 2014

AVs: Heaven or Hell?

Driverless Cars On Their Own

- Empty Zombie Cars Circling Around
- Inefficient Use of Transit
- More Pollution
- More Congestion
- More Suburban Sprawl
- Reduced Revenue Sources for Cities
- Cars Returning Empty

A Healthy Urban Ecosystem

- Reduced Downtown Congestion
- Optimal Utilization of Transit
- Walkable, Compact, Resilient Neighbourhoods
- Transit Stations at Community Hubs
- Preservation of Nature & Farmland

- Reuse of Parking for Community-Supportive Uses
- On-Demand Dynamic Routing
- Shared Mobility & Reduced Transportation Costs

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- Longer Commutes & Higher Transportation Costs
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Questions:
How do you make sure that AVs are available in the neighborhoods where they are needed?
How do you encourage ride-sharing?
How do you promote accessibility?
How do you continue to incentivize transit?
Conclusions

• Integrating TNCs and ridesharing into OTP is possible but challenging
  • Long term financial feasibility not clear
  • Needs to be simple and routine for user acceptance
• Social media and rewards/gamification are important elements in encouraging participation, promoting safety and community, and making the apps “fun”
• Integration with AVs will be the next logical step
• Planning ahead to create an equitable policy framework can ensure that AVs provide a net benefit to cities
Thank you!

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Building the cities of tomorrow