


Meeting EARPA FORM Forum

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A background of out-of-focus, colorful lights in shades of blue, red, yellow, and green, creating a bokeh effect.

# Paradigm shifts by multimodal user oriented transport services and platforms

## Story line....

- Digital transformation & innovative business models
- Future organisation mobility
- Future organisation Logistics
- New challenges and possibilities

## Transport sector technologies

Some words we know:

- IoT, Big Data, deep learning
- Automation modes and hubs
- New modes (Pods, hyperloop)
- Sustainable technologies
- Innovative services (MaaS, Physical Internet)
- Digitalisation, digital transformation

If disruptive, then what does it disrupt?

How does this all come together in the transport system....?

# 'Miracles' & Paradigm shifts – new solutions, new situations

	tragedy	problem
undesired outcome	yes	yes
solution available	no	yes



Innovations may turn tragedies into problems – (a miracle....)

	tragedy	problem
aware	adapt	solve
not aware	frustration	risk



Not solving a 'former tragedy' will not be accepted

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Solving a problem may lead to new problems and/or tragedies

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## Jeff Bezos' (CEO Amazon) business approach

### Obsession for clients/society

- Create a 'magical' experience
- Accept that there will be failures

### Sceptical about protocols

- Adapt the rules if it stands in the way of something good

### Open minded for external trends

- Embrace new possibilities; do not try to resist

### Fast decision making

- No standard decision making process but dedicated to the specific case (as light as possible)
- Do not wait for full information, but adapt later if needed (slow decisions will be more expensive)
- Aim for commitment rather than consensus

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## New business models...


Business model components (Tim O'Reilly) and impact on transport system:

- **Information instead of material** Vehicle sharing, cheaper products, lower prices
- **Deliver a magical user experience:** Personal treatment, no redundant actions, fully informed, combined services
- **On-demand service:** (only) available when it is needed
- **Network platforms:** Information accessibility, availability
- **Coordination by algorithms:** Increased reliability and flexibility, less time and costs
- **Employees supported by technology:** High service requirements, personalised information and solutions
- **On-demand asset and labour management:** Lower price

## Practical implications of new business models

- Significant cost reduction and service improvement > disruptive
- The platforms set the rules
- Workers (where still needed) are easily replaceable
- Ownership of assets is avoided where possible
- Availability of real time and integrated information is a key requirement (which is easier to do without cooperation....)
- Tendency towards a few large (global) players dominating the market

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## Business models – dedicated mobility services

Comparison of (current and future) dedicated mobility services; characteristics and (financial) risks			
service	characteristics	dependency/risks	ownership assets
taxi (current)	hired car + driver	personnel	company
Uber (current)	hired car + driver	driver service quality	mostly driver
Green Wheels (current)	hired car + self driving	driving quality driver, unused assets	company
On demand CAD (level 5) service (future)	Hired CAD	unused assets	mixed; depending on car ownership assumptions

## Business models – shared mobility services

Comparison of (current and future) PT services; characteristics and (financial) risks			
service	characteristics	dependency/risks	ownership assets
<b>PT: bus, tram, metro, train (current)</b>	fixed services + driver	low occupancy rate (costs assets + driver)	company
<b>on demand PT : (small) bus (current)</b>	flexible services + driver	low occupancy rate (costs assets + driver)	Company; could evolve to Uber constuction
<b>on demand PT : (level 5) automated bus (different sizes) (future)</b>	flexible services	low occupancy rate (costs assets)	Company
<b>tram, metro, train (level 5) automated (future)</b>	fixed services	low occupancy rate (costs assets)	Company

## Relative performance mobility services

Drivers for PT options choice in the transition towards level 5 automation (future); 5=high relevance, 1=low relevance

	urban	inter-urban	rural
low density will lose from new business models (not competitive)	3	4	5
low frequency schedules will lose share to on demand (even at some higher costs)	3	4	5
door to door is preferred over connecting rides (even at some higher costs)	5	4	3
limited supply of on demand (increased waiting time and higher costs)	1	3	5

Market potential of PT mobility options with level 5 automation (future); 5=high potential, 1=low potential

services	urban	inter-urban	rural
On demand car	5	3	2
on demand bus (different sizes)	3	2	4
scheduled bus	1	3	
tram	3		
metro	3		
train		4	1

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## Business models logistic services - road

Comparison of truck services at different automation levels; characteristics and financial risks					
truck automation	main changes/innovations	characteristics	dependency/risks	ownership assets	operation
level 3	platooning	efficiency gains due to cooperation by platooning	unused assets, unused personel	company	contracted personel
level 4	platooning, last mile services/DCs/hubs at highways	Upcoming split automated long distance services on highways and last mile services with drivers	unused assets, unused last mile personel	company/asset provider	contracted personel for first/last mile activities
level 5	as above + city distribution services	last mile services combined with city distribution services	unused assets	company/asset provider	contracted personel only for service aspects (incl. handling)

## Impact on logistics

(By vehicle automation level)

Level 3 :

- energy/cost saving by platooning


Level 4 :

- labour cost saving (can be -50%!)  
• (virtual) level 4 network  
• rise of hub-hub services (platforms)  
• **Potential shift freight to road from other modes**

Level 5 :

- automated city distribution service (platforms)  
• rise of mixed passenger/freight services  
• **Potential congested urban areas**

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Solving a problem may lead to new problems

## Transport market and governance implications

- Market domination by a few large players vs collective EU system
- High-level governance of information sharing and multi-modal platform development
- Transparency of algorithms - fairness
- Timely harmonisation of systems, standardization and interoperability
- Inclusiveness of all income groups should be guarded
- Pro-active design of the 'level 4 network' for freight

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## Transport market and governance implications (2)

- Ability to influence algorithms – influencing traffic flows by changing settings (hands-on policy making)
- Balance the innovation speed of the different modes – rapid digital transformation of non-road modes is a must (in particular rail, tram, metro)

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## Main Messages

1. Think algorithms – Do algorithms – Control algorithms
2. Algorithms serve us – we do not serve algorithms
3. Know what you want or get what you do not want