



# Organizing digital mobility

Digital acceleration in the rail industry

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# Contents

- 1 The digital disruption is happening all around us, and it is happening now
- 2 Digital is disrupting the way we need to think about delivering on our transportation mission
- 3 Progress is underway, but we must accelerate
- 4 That journey starts today

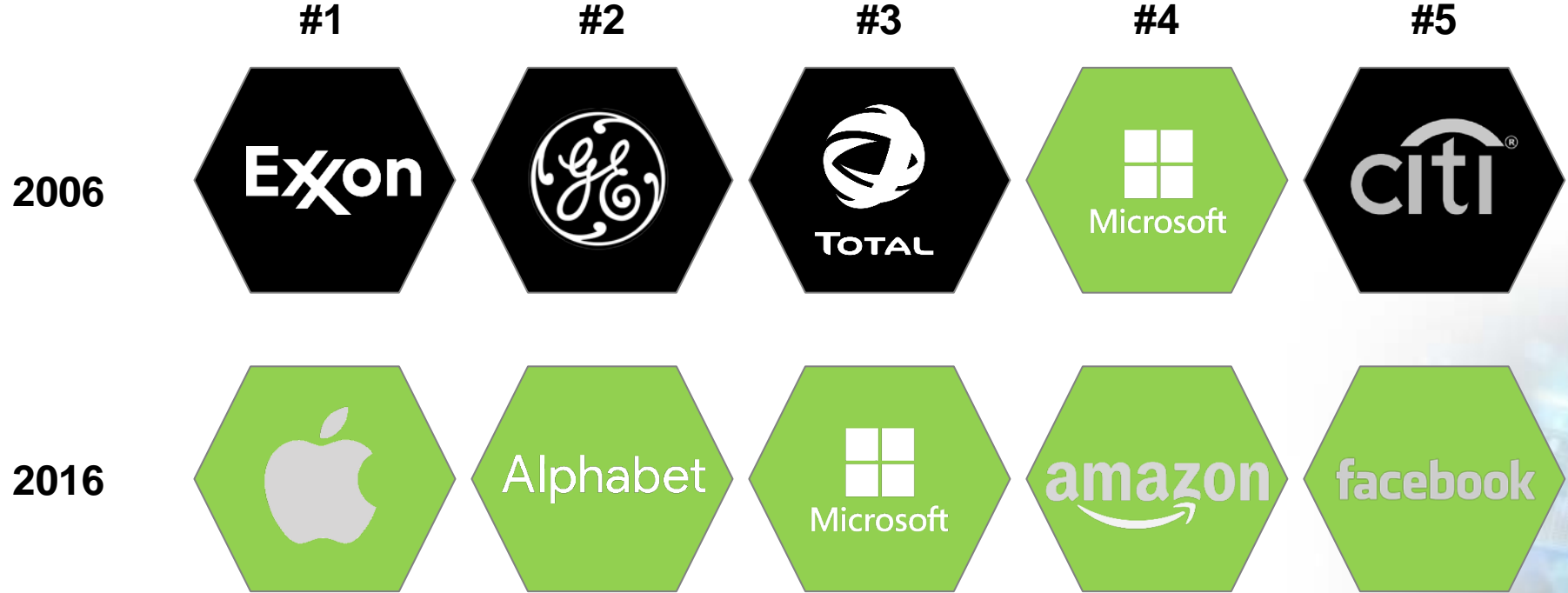
# Technology is disrupting every aspect of our lives



# Disruptive technologies are rapidly changing the composition of industry

## Top 5 publicly traded companies by market cap

Legend:  
Green hexagon: Tech  
Black hexagon: Other



1 By market cap

SOURCE: Visual Capitalist

# Industry after industry get disrupted, and the travel and transportation industry is no exception

Digital has changed entire industries

VS.				
				

Initial changes already visible in TTL (despite regulation and asset intensity)

VS.	Tour operators		Hotel chains	Freight forwarders and carriers	Contract logistics providers	Couriers
						

# DIGITALIZATION – Much more than just technology



## Transformation

User behaviour

Business model

Marketchannels

“Each product is a  
(digital) service  
just waiting to  
be realized.”

Value chain

Technology

Eco-system

# MEDIA – A FIRST MOVER

## ICT MEDIA 23%

Streaming music, on-line games, web & IP TV, web news, media apps, etc.



MOBILE COM



BROADBAND



CLOUD

Media

Transport

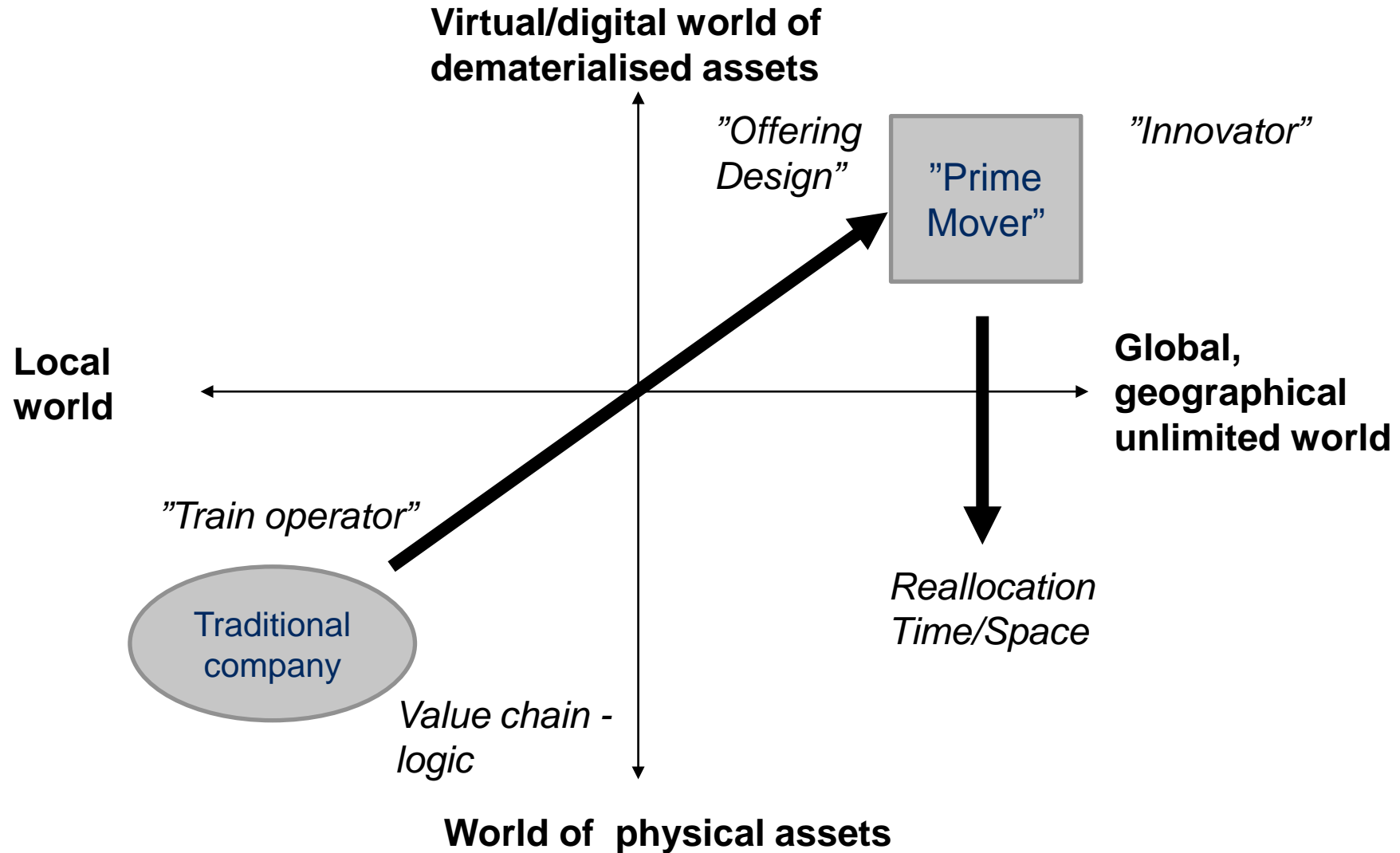
Utilities

Health

Etc.

# Reconfigure or be reconfigured

– Rail as prime mover..?





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Judy Goldberg  
Sony Pictures

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You don't need a digital  
strategy.

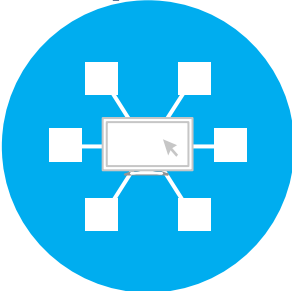
You need a **business  
strategy for the  
digital age**



# 6 disruptions could fundamentally change the travel and transportation industry

● Current disruptions

● Upcoming disruptions



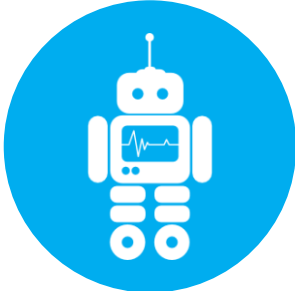
## Online platforms

"Traditional TTL companies as capacity providers only?"



## Expansion of large technology companies

"Fear of the hungry tech giants?"



## Advanced robotics

"Fundamental changes to cost structures?"



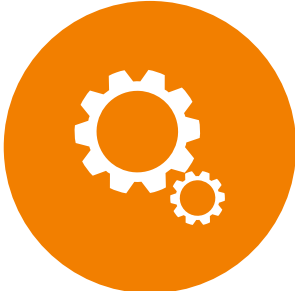
## Asset sharing

"The door opener for innovative startups in the industry?"



## Autonomous vehicles

"Cost structures, opportunities, competitors – will everything change?"



## Additive manufacturing

"The 'big hit' to the logistics industry?"

# Rail has still not seen significant disruption, but it could be a matter of time before transportation becomes a utility

“

Our ultimate goal is to build a network of transportation as reliable as running water, everywhere for everyone. **Kalanik, Uber CEO**



”

One asset network – many applications



Taxi industry	■ ■ ■ ■ ■	<b>Very high</b>
Courier service	■ ■ ■ ■ ■	<b>Very high</b>
Auto rentals	■ ■ ■ ■	<b>High</b>
Car-sharing industry	■ ■ ■ ■	<b>High</b>
Automotive industry	■ ■ ■ ■	<b>High</b>
Express, parcel delivery providers	■	<b>Possible future target?</b>
Freight logistics		

What other unused or underutilized assets are there?  
Which sharing models are conceivable?



# Increasingly autonomous vehicles could have significant impact on passenger rail modal share



## Partial automation

- System controls steering and acceleration/ deceleration – driver still in charge
- Reduces accidents
- Available today



## Highly autonomous Drive

- System executes all driving tasks for majority of driving – not relying on driver to be able to intervene
- Frees up driver time
- Likely available ~2020 - What all premium OEMs aim for



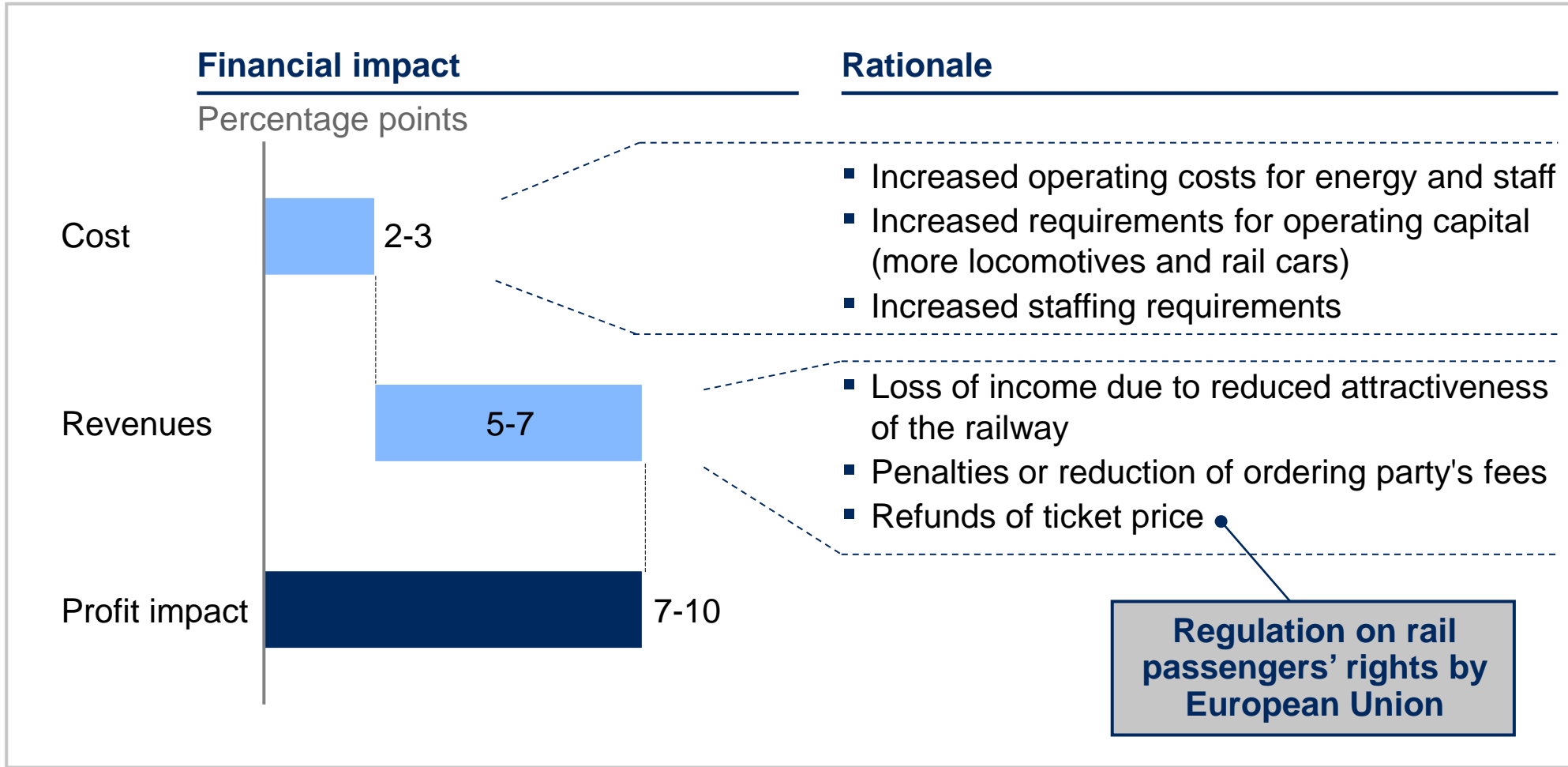
## Full automation / driverless

- Automated transportation from A – B – No steering wheel required
- Will completely change urban mobility
- Likely available ~2020 – Focus of tech players

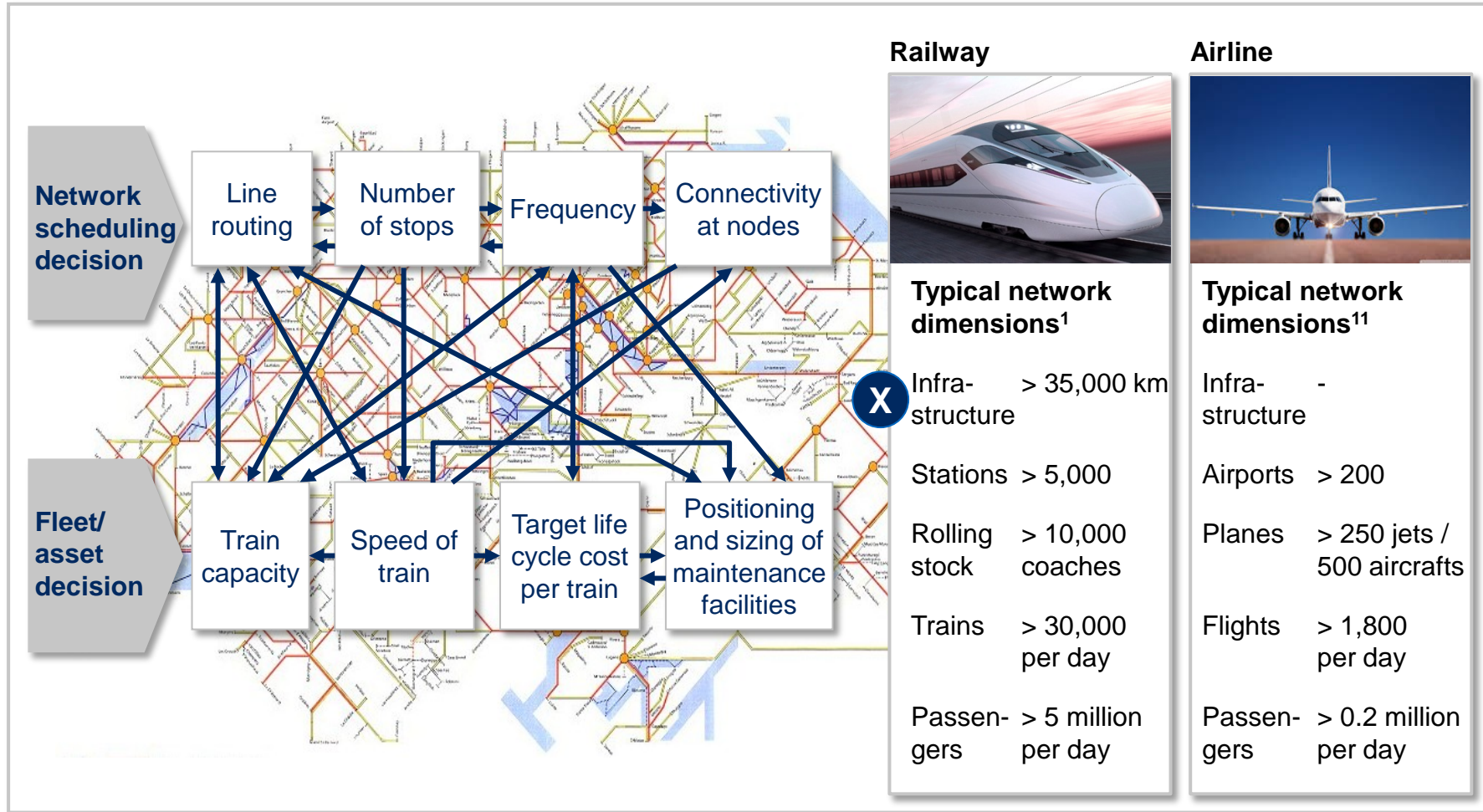


The opportunity from digital is immense: increasing punctuality through big data analytics and IoT would have deep impact on the railways' profit...

CASE EXAMPLE



... as would improving system design and fleet management through advanced analytics



1 European operator

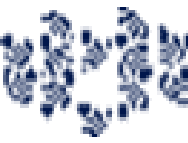
# Internet of Things

## Enabling technologies



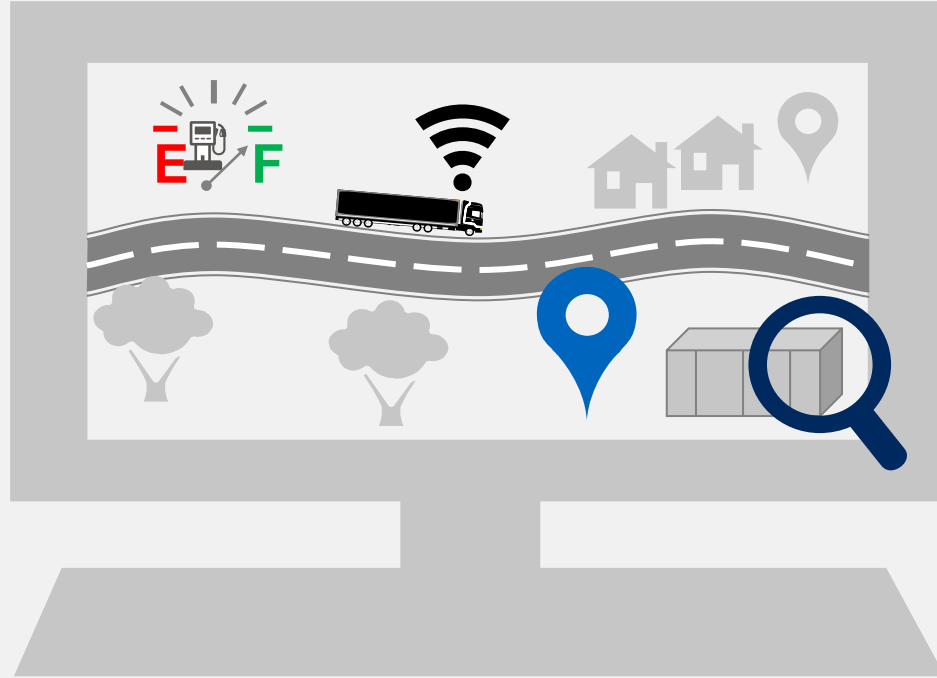
IoT





# IoT is expected to enable significant value in transportation

**Proactive, remote diagnostics**, can improve efficiency of workshops by 5-10%



## **Data monetization**

Collecting and reselling big data to third parties

**Platooning** can reduce fuel consumption by 4-8%

**Driver assistance** systems can reduce number of collisions by 25%<sup>1</sup>

**Predictive maintenance** can reduce annual R&M spend by 10-40%

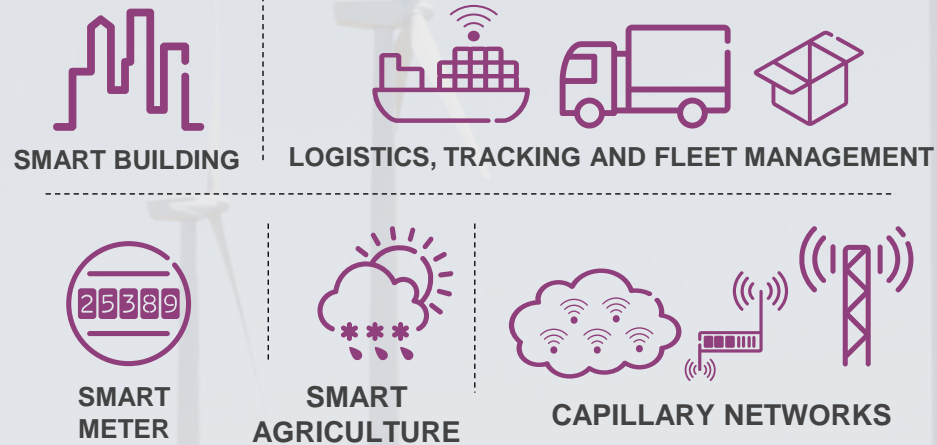
**Optimizing vehicle specifications** with a **configurator** can reduce fuel consumption by 5-10%, R&M costs by 5% and save 15% of sales reps time

<sup>1</sup> Based on passenger car data

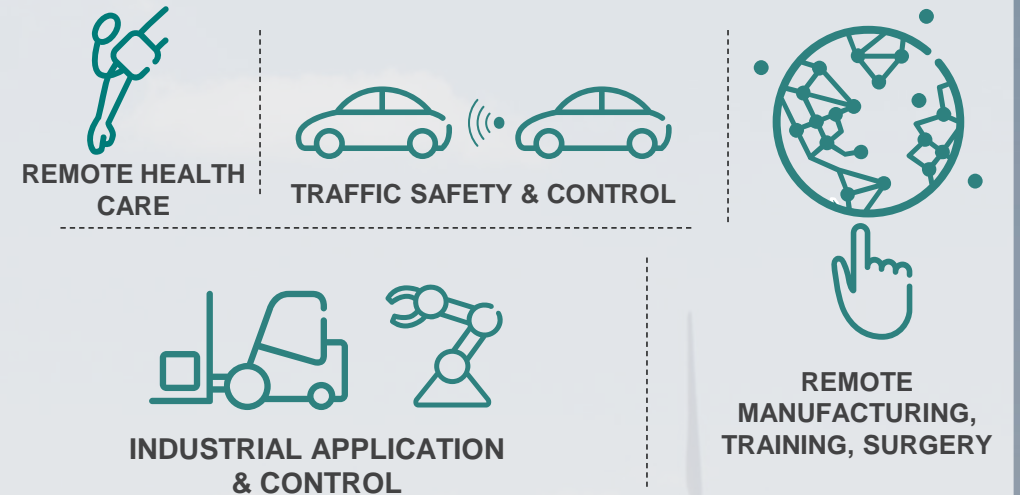
# A BROAD SPECTRUM OF REQUIRMENTS



## Massive IoT-communication



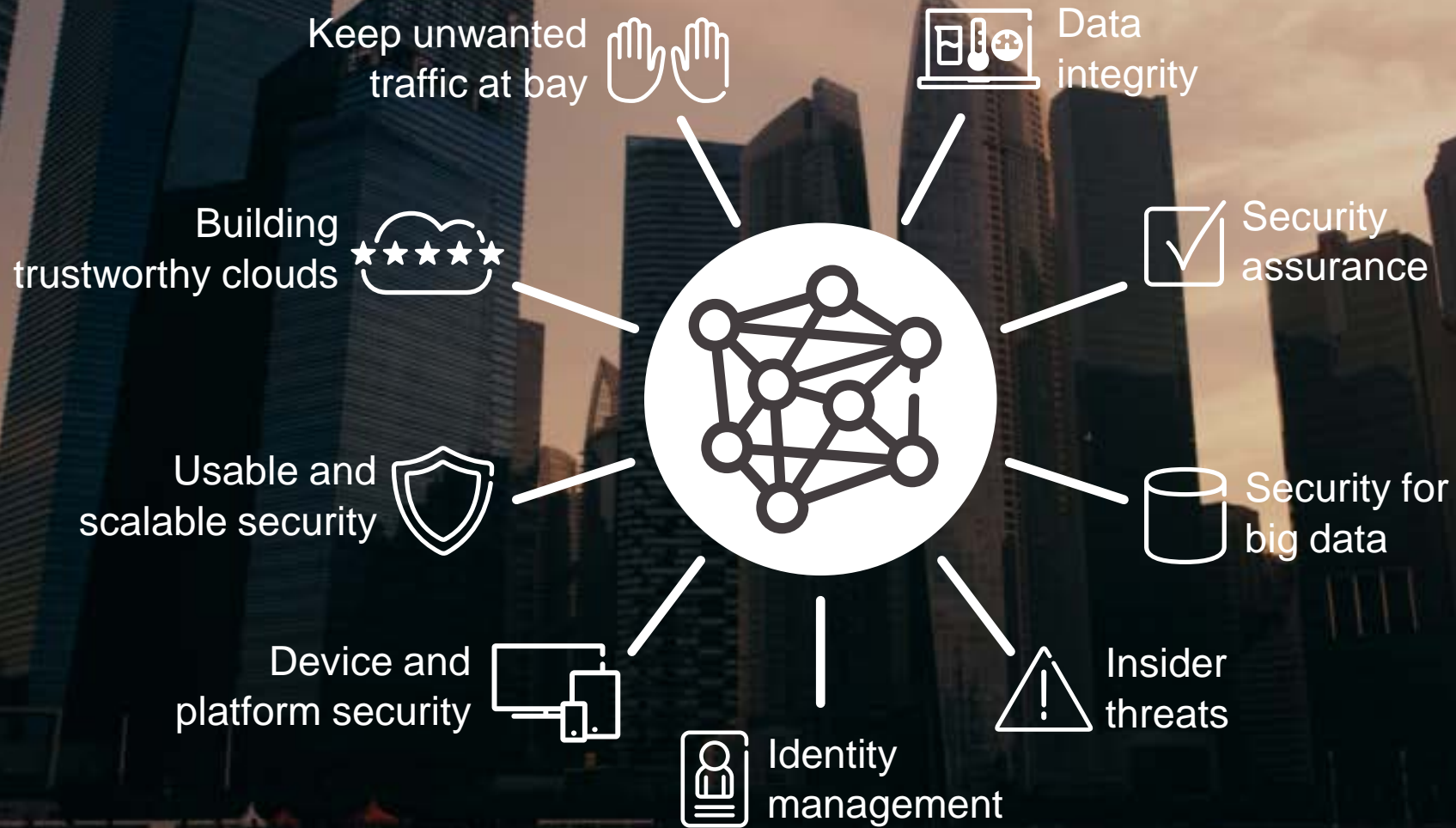
## Critical IoT-communication



LOW COST, LOW ENERGY  
SMALL DATA VOLUMES  
MASSIVE NUMBERS

ULTRA RELIABLE  
VERY LOW LATENCY  
VERY HIGH AVAILABILITY

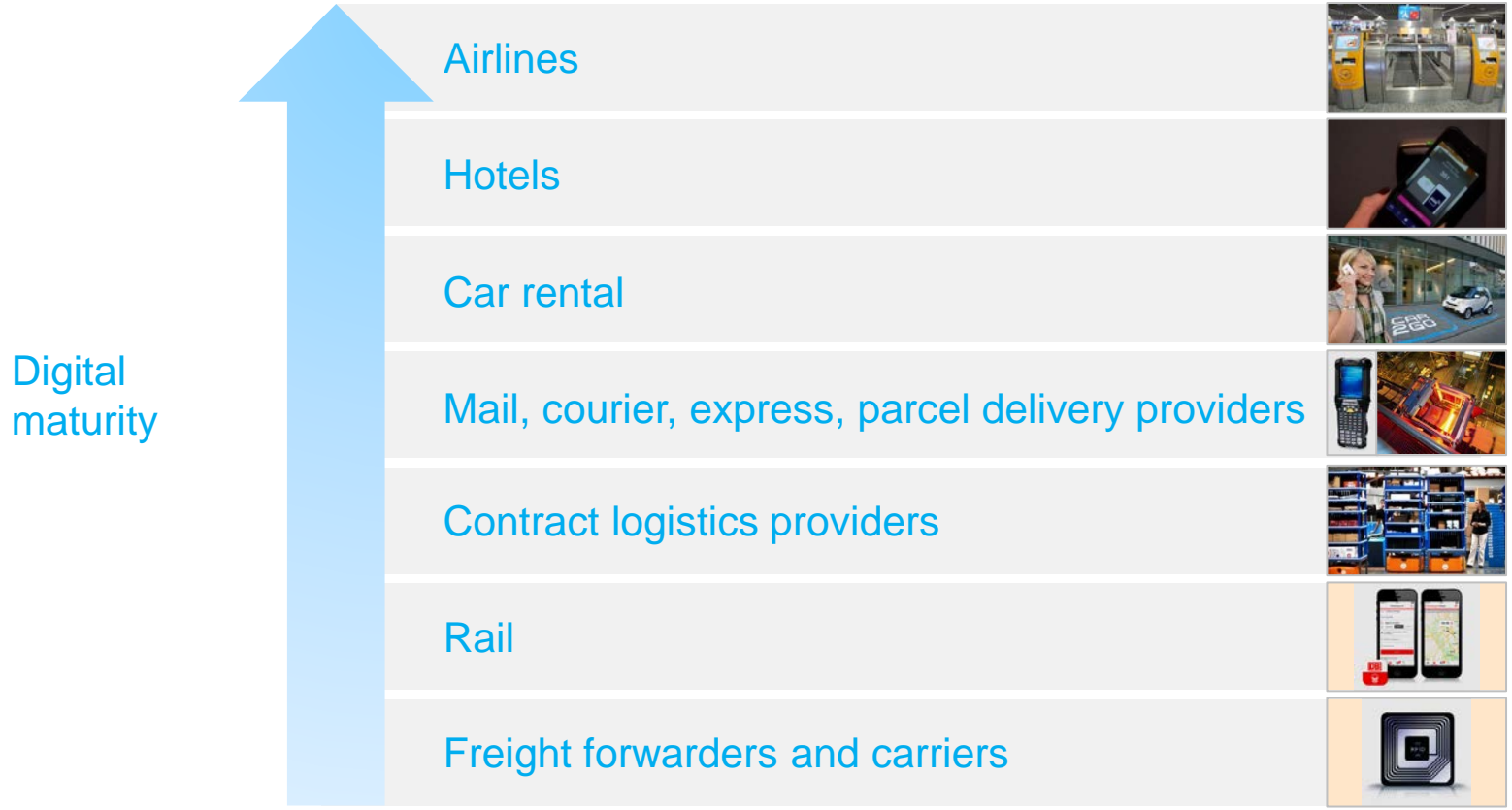
# CYBERSECURITY



# Contents

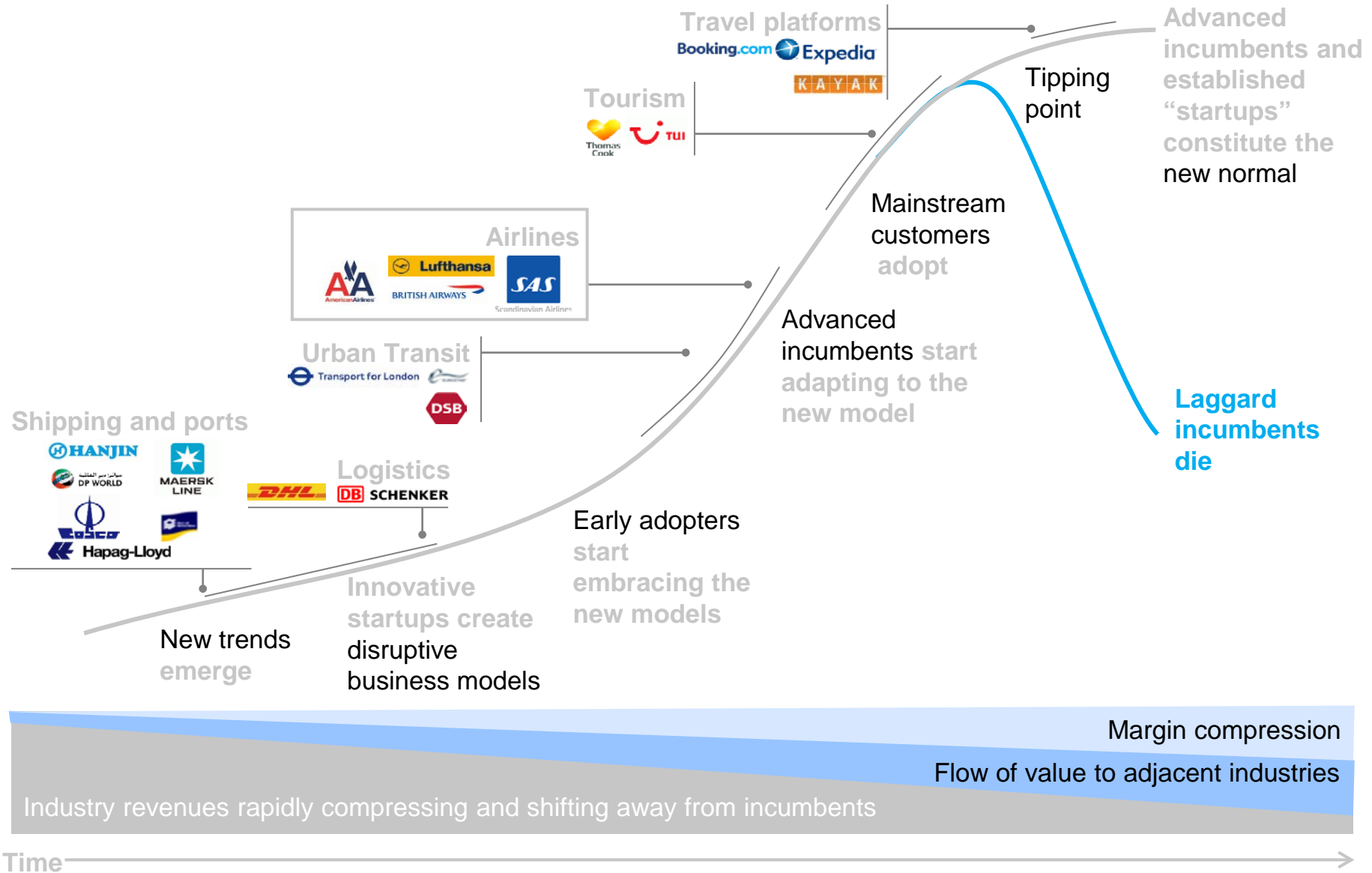
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# Digitalization is underway; maturity varies by industry, but most potential is yet untapped

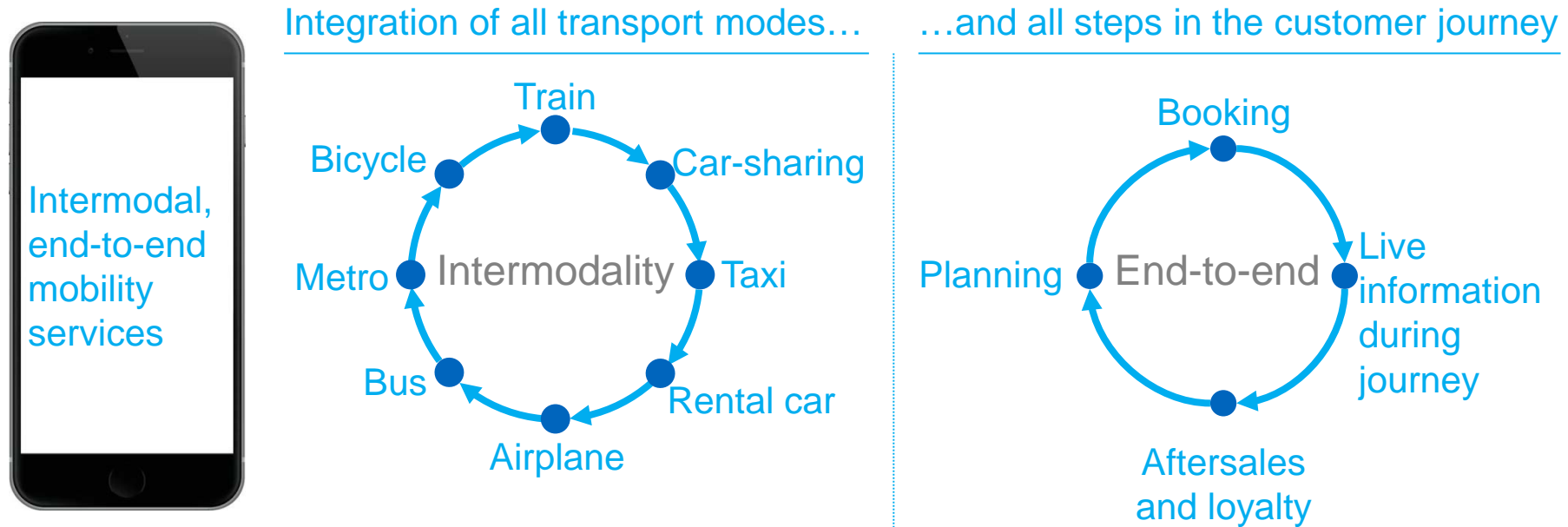


- Efforts to date have mostly digitized the business “as-is”
- Organizations either haven’t recognized the real digitalization opportunities yet, or aren’t capable of implementing them

# The rail industry may soon face the tipping point of the digital lifecycle



Exciting progress exists, for example new mobility services aiming to satisfy customers' mobility needs by offering seamless end-to-end services across all transport modes



- A diverse set of players have invested in these solutions, from traditional rail companies to car manufacturers to independent start-ups

**Qixxit** **moovel** **allryder** **resrobot** **UbiGo** **smi)e**

- As mobility integrators, these players are building upon an ecosystem of partners

# MOBILITY-AS-A-SERVICE

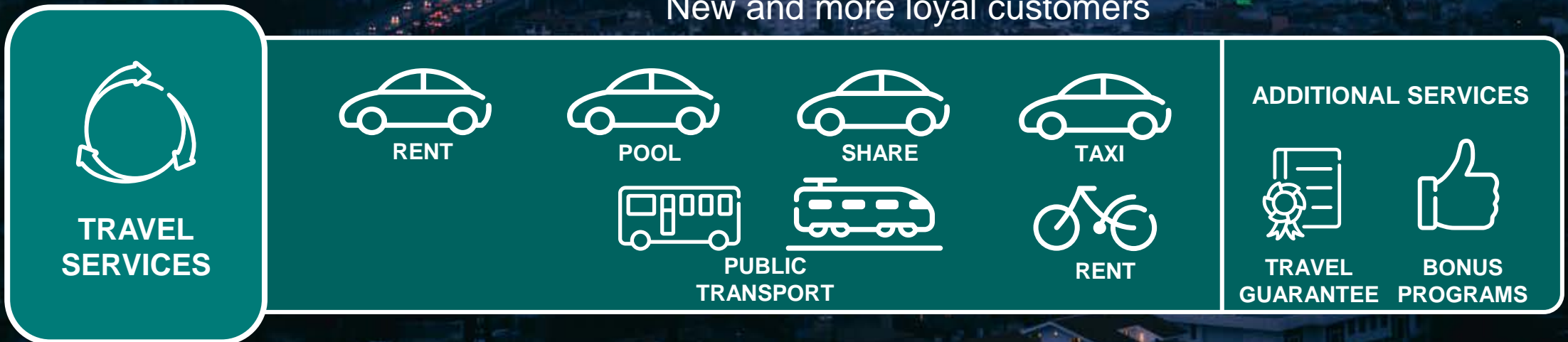
## ONE-STOP-SHOP FOR TRAVEL SERVICE COMBINATIONS



Simplicity

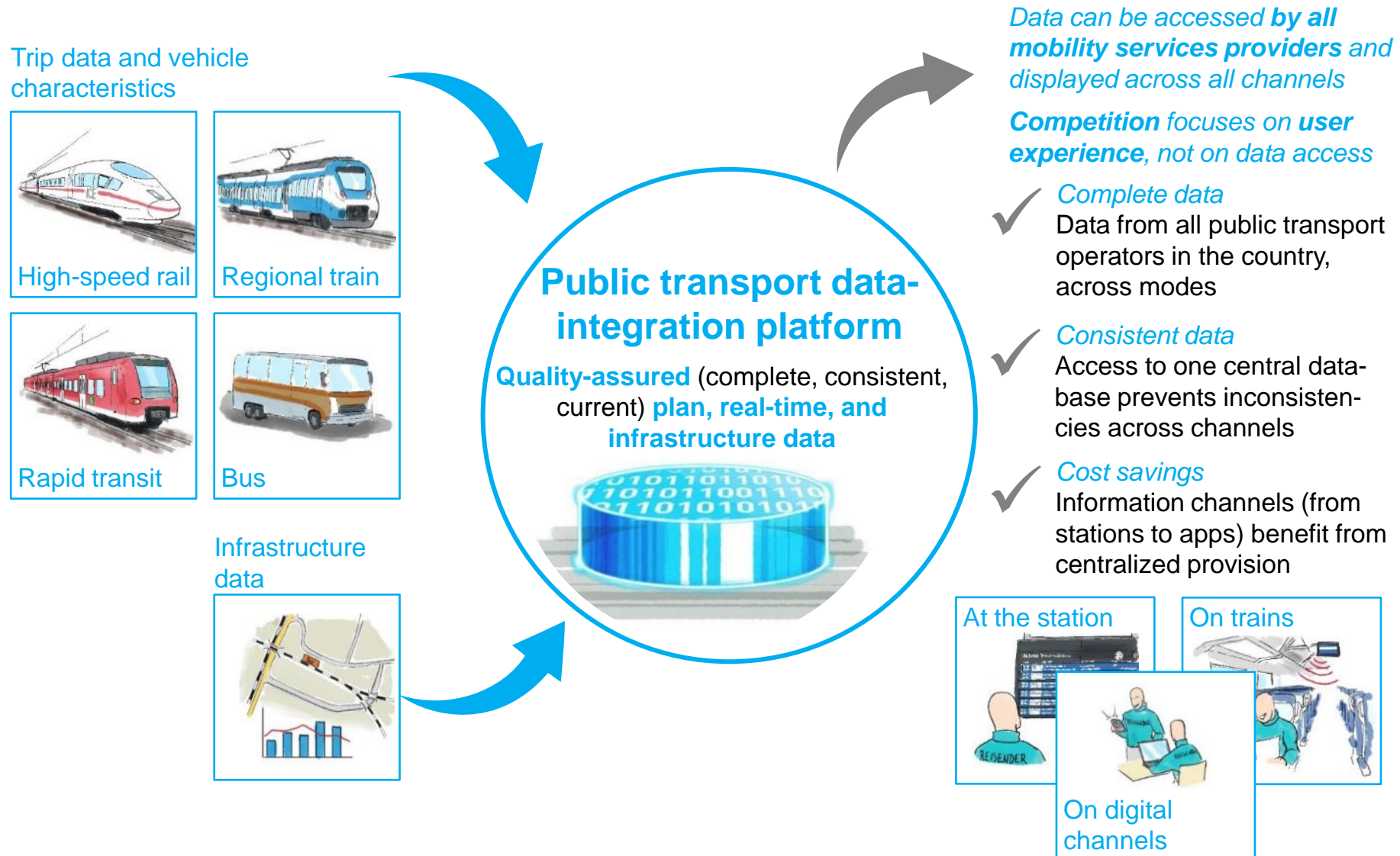
Your Mobility-as-a-Service broker

New and more loyal customers





# Data-integration platforms consolidate transport data across providers and modes, supplying mobility services providers with coherent data sets



# In some European countries, public transport information platforms have already been built up – in others, platforms are currently being crafted



- Transit concession contracts **require all rail companies** to provide data
- Raw data (plan, real-time, delays) available to **everyone at no cost**; routing data for a small fee per request



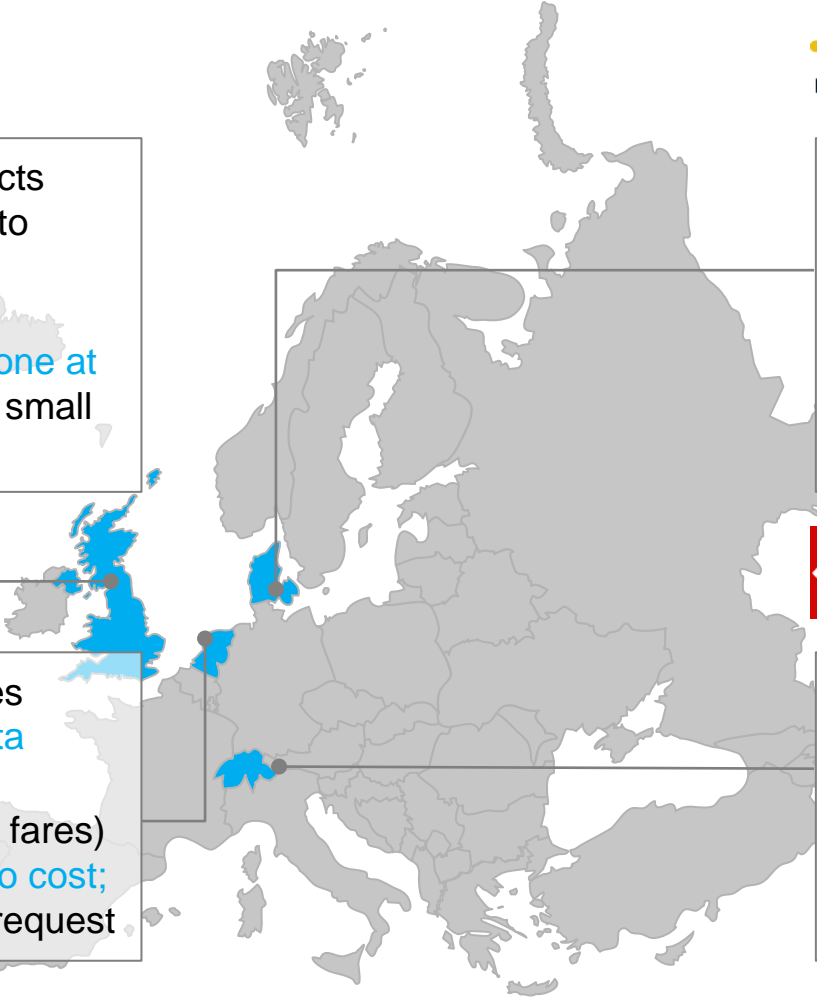
- Public transport companies **incentivized to provide data** (voluntarily)
- Raw data (plan, real-time, fares) available **to everyone at no cost**; routing data for a fee per request



- Public transport companies **voluntarily provide data**
- Raw data and routing data available to **everyone at no cost** (real-time data not public)



- All public transport companies **legally required** to provide data
- Raw data (plan, real-time) **available to everyone at no cost** as of 12/2016



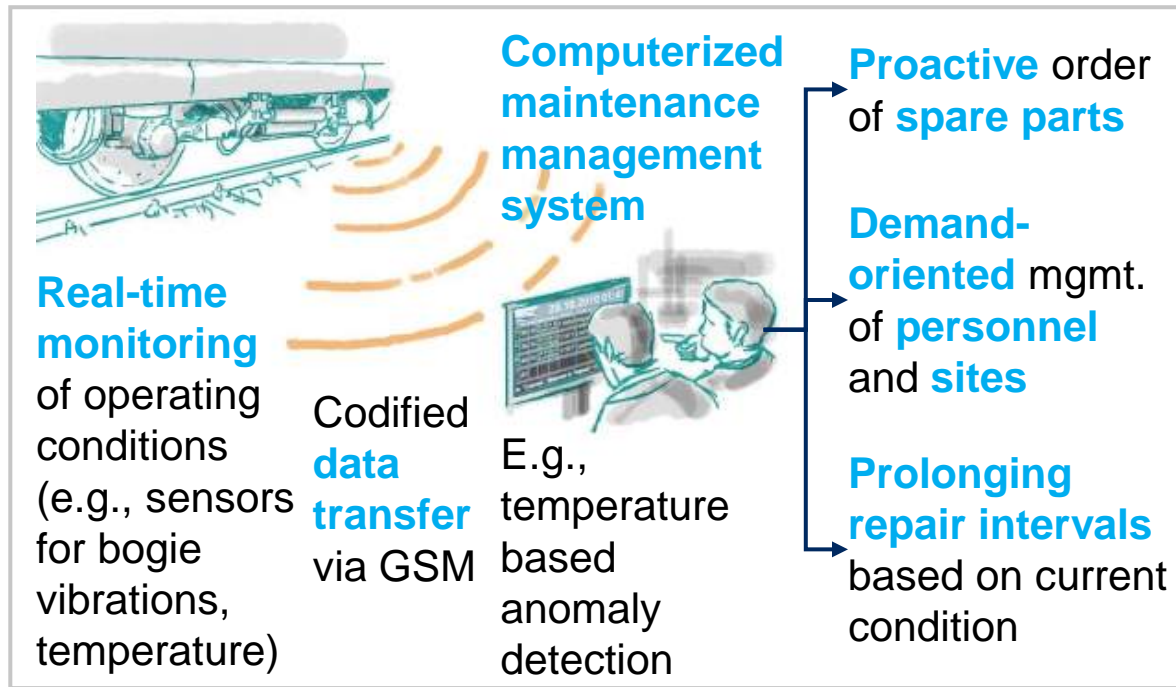
# Start-ups use the open public transport data for travel applications that encourage the use of public transport: UK example



	iGeolise	Citymapper	masabi
<b>Value proposition</b>	<ul style="list-style-type: none"> <li>Visually presents the time needed to reach a particular location</li> <li>Measurable advantages for companies include, e.g., higher conversion rates – for instance, 300% conversion improvement for real estate portal Zoopla</li> </ul>	<ul style="list-style-type: none"> <li>Simplifies navigation in complex cities</li> </ul>	<ul style="list-style-type: none"> <li>Enables mobile purchase of electronic tickets</li> <li>Especially relevant for cities without a modern ticketing system</li> </ul>
<b>Product</b>	<ul style="list-style-type: none"> <li><b>TravelTime:</b> B2B interface that shows the shortest route to a destination or the radius that can be reached within a specified time</li> <li><b>MinuteMapr:</b> B2B tool for analyzing locations in terms of their reachability</li> </ul>	<ul style="list-style-type: none"> <li>B2C: App for selecting the fastest real-time route within large cities</li> <li>B2B: Interface for companies that need real-time routes (e.g., Four-square)</li> </ul>	<ul style="list-style-type: none"> <li><b>JustRide:</b> Cloud-based system for buying public transit tickets electronically</li> <li>Offers users access to schedules and allows transport companies to analyze sales transactions in real time</li> </ul>
<b>Modes</b>	<ul style="list-style-type: none"> <li>Walking, bicycle, car/taxi, public transport, and rail</li> </ul>	<ul style="list-style-type: none"> <li>Walking, bicycle, car/taxi, car-sharing, public transport, rail, ferry</li> </ul>	<ul style="list-style-type: none"> <li>Public transport, rail, ferry</li> </ul>

# Real-time monitoring is setting a new standard for cost efficient rail reliability

- Siemens maintenance for 26 Velaro E high-speed trains (Spain)
- Punctuality benchmark **>99.9% on-time rate** (ticket refund if >5 min delayed)
- **State-of-the art real-time monitoring** leads to
  - Extremely **high reliability and availability** of trains
  - **Cost efficient service delivery** from optimized utilization of staff and extended lifetime of parts



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We in the railway industry need to take advantage of the disruptions and capture the opportunities

# Digit

**Disruptive technologies** that...

... **ease consumers' life...**

- more convenient,
- Quicker
- Cheaper
- higher quality

...and **disrupt companies operations**

- Enhance customer access
- Reduce cost
- (Dis-)intermediate
- increase transparency

## ➤ Adapt to **Digital Disruptions**

New products & services

New business models

New competitors

## **Digitize your Core**

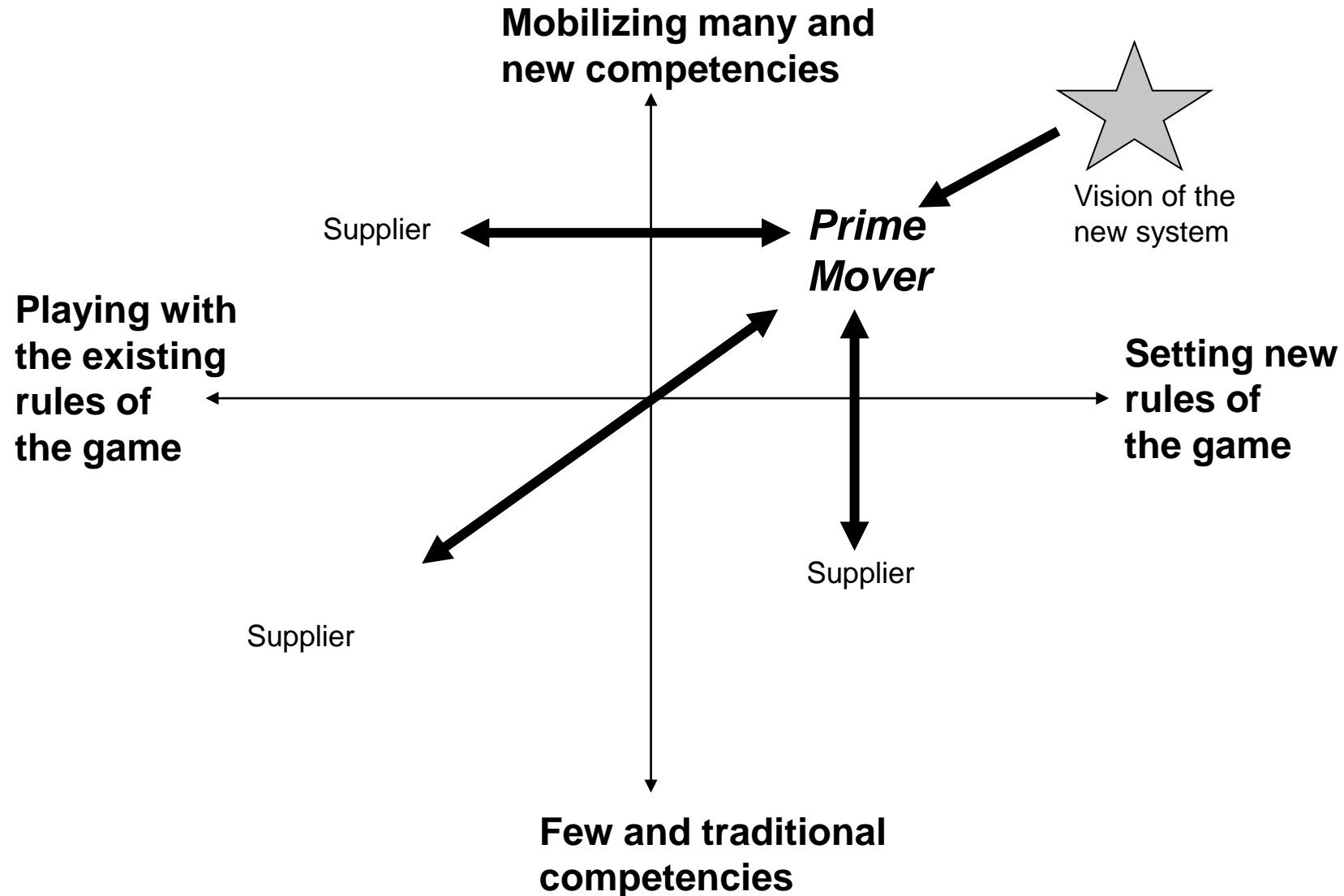
Digital customer interaction (front office)

Digital end-2-end processes (back office)

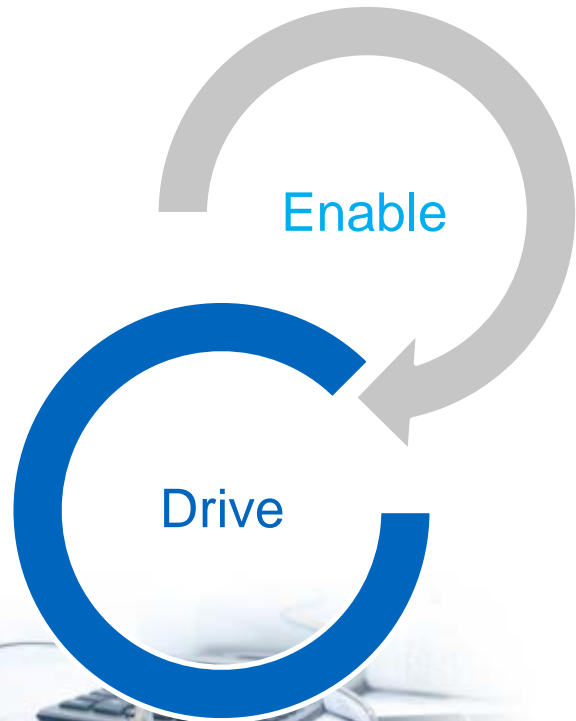
Data-based decisions and big data

# New role for Train operators

## "Prime Mover" – Organizing Digital Mobility



# 7 learnings from successful responses to technology responses



	Examples
1 Be <b>unreasonably</b> aspirational	<ul style="list-style-type: none"><li>▪ Board-level digital “owner”</li><li>▪ A stretching and coherent digital vision</li><li>▪ Value-oriented targets, i.e., digital P&amp;L</li></ul>
2 <b>Acquire</b> new capabilities	<ul style="list-style-type: none"><li>▪ Buying scarce talent en masse</li><li>▪ Moving into adjacent markets</li><li>▪ Hiring for skills, not industry experience</li></ul>
3 <b>Ring-fence</b> and cultivate talent	<ul style="list-style-type: none"><li>▪ Protecting digital talent from business as usual</li><li>▪ Digital talent management</li><li>▪ Aligning organization to architecture</li></ul>
4 Challenge <b>everything</b>	<ul style="list-style-type: none"><li>▪ Challenging the status quo</li><li>▪ Going your own way</li><li>▪ Involving regulators in change</li></ul>
5 Be <b>quick</b> , agile, and data driven	<ul style="list-style-type: none"><li>▪ Continuous proposition iteration and live beta</li><li>▪ Golden source of truth</li><li>▪ Clear and tangible KPIs measuring success</li></ul>
6 Follow the <b>money</b>	<ul style="list-style-type: none"><li>▪ Identify and secure strategic control points</li><li>▪ Zero-base tech budget aligned with value at stake</li><li>▪ Investing in digitization across the value chain and scale quickly</li></ul>
7 Be obsessed with the <b>customer</b>	<ul style="list-style-type: none"><li>▪ Learning from every interaction with the customer</li><li>▪ Relentless iteration of customer experience</li></ul>



# How we can get started on the journey

## Discover



Shape digital ambition, strategy, and business case based on insights

### Sector-level insights

- Customer insights
- Industry developments
- Sources of disruption
- Do's and don'ts

### Company-level bench marking

- Digital Opportunity Scan
- Digital Capabilities
- Best practice sharing

### Inspiration for digital vision and strategy

- Best practice examples
- CDO network
- 'Go and see' safaris
- Hackathons
- Aspiration workshops
- Board/CEO aspiration setting

## Design



Reinvent and prototype new capabilities and breakthrough journeys as part of a program

### Core: Customer experience and E2E processes

- End-to-end process redesign
- Go to market approach

### Foundations: Enterprise architecture

- Validated design principles
- Business-first approach
- Pragmatic road-mapping

### New frontiers

- New business build plans
- Getting off the ground
- Manage core v non-core

### Foundations: Digital-ready organisation

- Structure
- Talent
- Metrics / incentives
- Processes
- Culture
- Top mgmt. commitment

### Advanced analytics

- End-to-end use cases
- Foundations

## Deliver



Activate an ecosystem to rapidly deliver at scale

### Effective, tech-agnostic PMO

- Seasoned change managers
- Fully IT-agnostic
- Top talent deployment

### Proven capability-building

- Capability-building centres
- On-site coaching
- "D-BOT" – Digital Build, Operate, Transfer

### Global network of partnerships

- Platforms
- System Integrators
- Niche players

### Deep internal capabilities

- Digital Labs
- Specialist acquisitions

### Advanced Analytics

- Use case delivery

## De-risk

Structure the change program, resources, and commercial models to reduce operational and financial risk

- Go for impact
- Thoughtful sequencing to enable self-financing
- Make successes visual





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Mark Zuckerberg  
Facebook

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The **biggest risk is not taking any risk.**

In a world that is changing really quickly, the only strategy that is guaranteed to fail is not taking any risk.