



SIEMENS

Mobility Management

# Rethinking Rail & Road. Expand. Optimize. Integrate.



# Agenda



## Challenges and the importance of mobility for cities

### Three approaches to the challenge of urbanization

- Expand
- Optimize
- Integrate

### Mobility Management

- Facts, Figures, Philosophy, Approach to Security

### Portfolio

- Rail Automation (Mainline, Mass Transit, Freight & Products)
- Road & City Mobility (Intelligent Traffic Systems, Innovative Technologies)

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# The world of mobility is facing tremendous challenges ...



Globalization of transport



Aging and growing population



Climate change and resource scarcity



Disruptive technology



Smart data and cloud IT

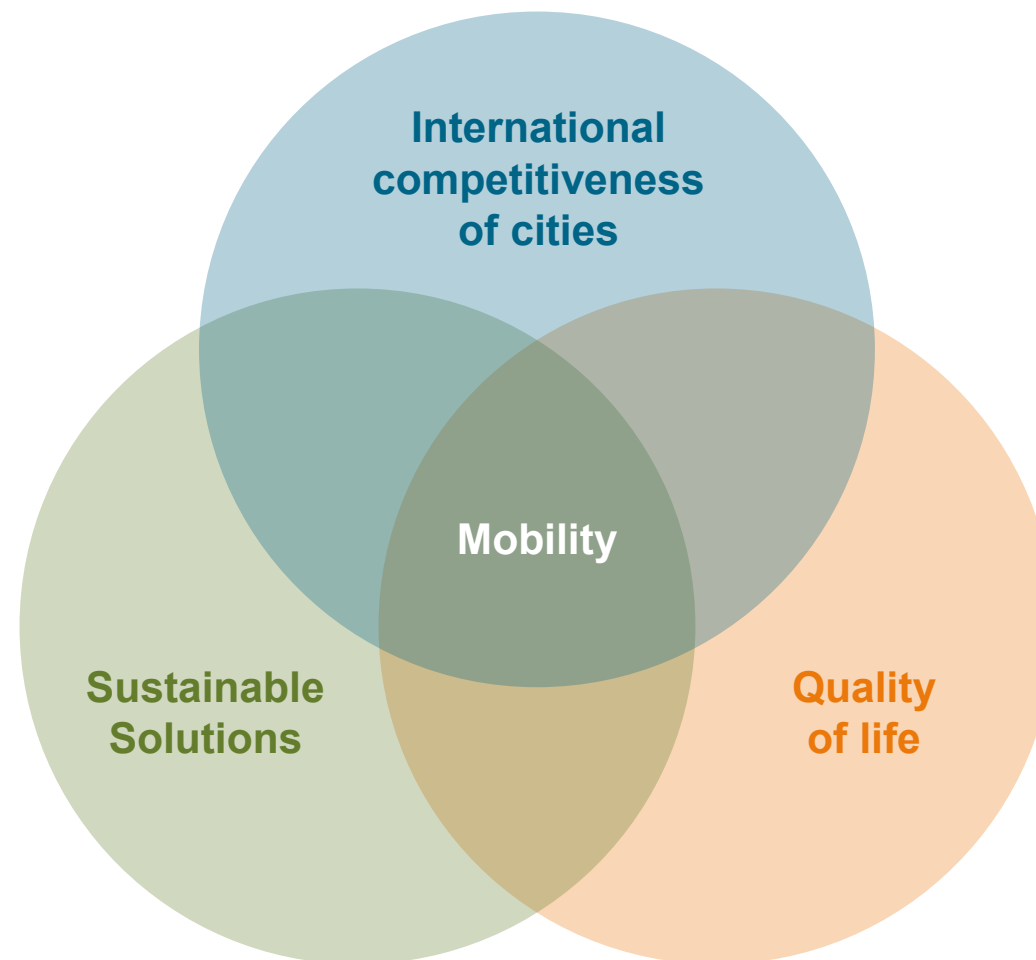


Behavioral change: "Shareconomy"

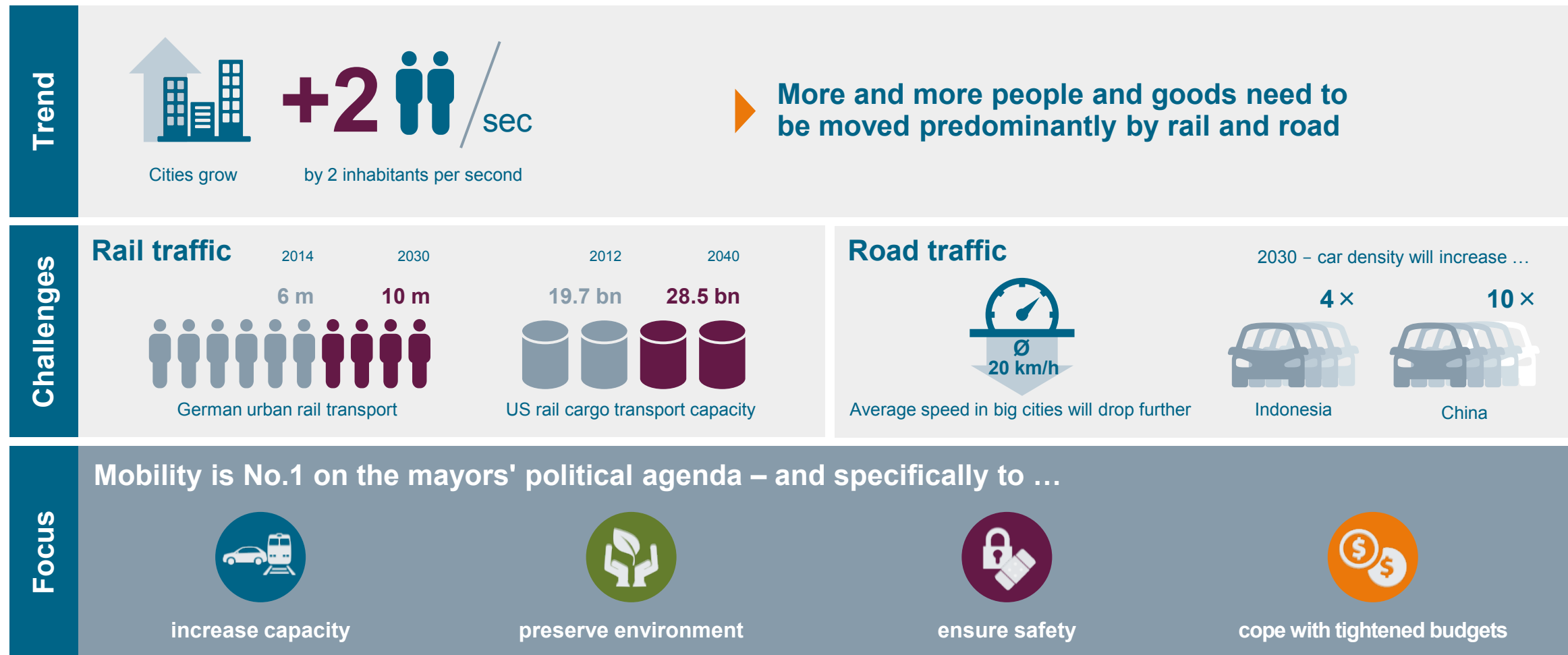
... and most importantly the trend towards urbanization

## The need for new mobility solutions in cities

- To face rising challenges and cities depend on mobility to stay attractive
- Mobility becomes a critical success factor in international competition
- Only cities with convincing mobility concepts attract investments and inhabitants
- Transportation is also a key driver in protecting the environment



# Rail and road transport networks are crucial for mobility in cities



Source: U.S. Department of Transportation – [ops.fhwa.dot.gov/FREIGHT/freight\\_analysis/faf/index.htm](https://ops.fhwa.dot.gov/FREIGHT/freight_analysis/faf/index.htm)



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# Siemens answers to urbanization

## 1. Expand existing mobility infrastructures

When expanding infrastructures, Siemens anticipates future demands, e.g. seamless upgrades and extensions

- Siemens can implement state-of-the-art technologies right from the start, safeguarding performance and investments in the long-term
- Greenfield approach is recommendable for emerging countries, e.g. India, Saudi Arabia



### Automatic train operation

Beijing/Tianjin, High-speed

- New high-speed line was commissioned for the Olympic Games in 2008
- More than 70 trains a day: most intensive high speed service in the world
- Maximum travelling speed: 350 km/h
- Length of line: 117 km



### Tolling system

Tel Aviv, Fast lane

- System calculates the toll dynamically according to the current traffic situation
- Part of the income is used to finance free shuttle buses to the city
- Length 13 km, around 6,000 cars per day

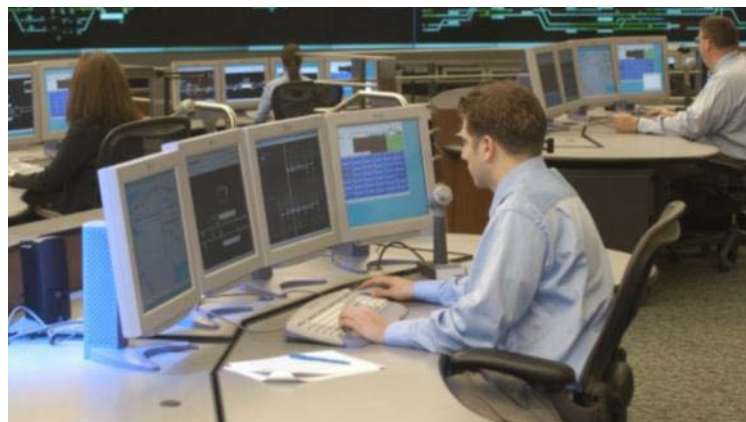


# Siemens answers to urbanization

## 2. Optimize existing mobility infrastructures

To adapt to lack of space for new lines and roads, Siemens uses automation and IT solutions

- Shorter headways increase transport capacities
- Flexible train operation according to capacity demand
- Optimized traffic flow reduces congestions and environmental impact
- Advanced asset and maintenance management improves availability and efficiency



### Automatic train operation New York subway

- Upgrade of the metro system with the automatic train supervision system (ATS)
- Commissioned in May 2008
- Length of line: approx. 175 km/172 stations



### City tolling London

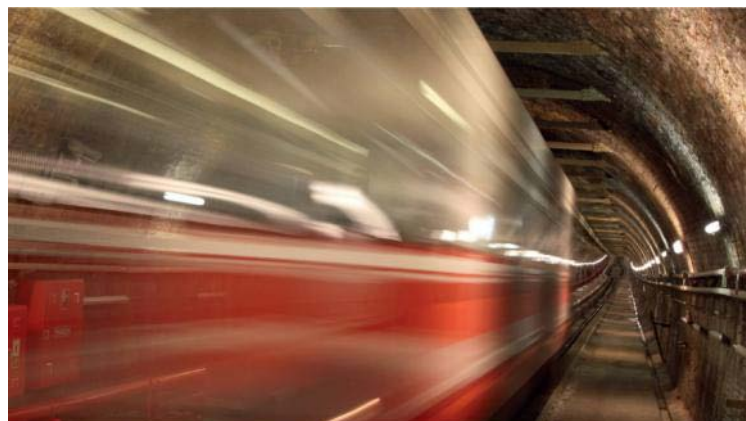
- Reduced street traffic in London City by around 20%
- Cut CO<sub>2</sub> emissions by 150,000 tons a year
- Accelerated traffic flows by 37%
- 30% less congestion

## Siemens answers to urbanization

### 3. Integrate all transport modes

Siemens offers solutions for integration of mass transit, mainline rail and bus operators, taxis, car and bike sharing providers, P&R and parking facility operators

- Integrated Mobility Platform (IMP) improves mobility chains for both passenger and freight transport
- It enables planning, booking and billing of multimodal trips according to individual preferences as well as environmental and economical criteria



#### Linking Europe and Asia Marmaray project (Gebze-Halkali)

- Upgrade of commuter rail system through metropolitan areas plus tunnel construction with Trainguard Futur 1300 and Trainguard Sirius CBTC
- Length of line: approx. 76 km
- Commissioned in Oct. 2013 (Phase 1)
- Completion: 2016 expected



#### Traffic Control Center Berlin

- Installation of a common technological platform
- Networking of independently arranged traffic management and control systems. Analysis of real-time and collected traffic data.
- Monitoring and controlling of 2,000 traffic lights and 300 cameras



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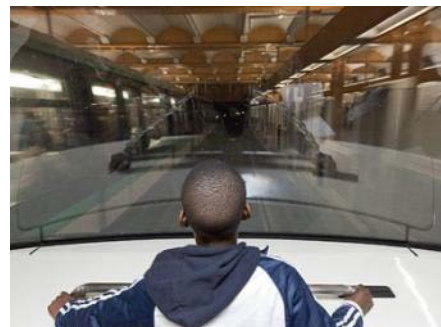
# Siemens Mobility Management



... has, as a **leading manufacturer** in the field of mobility solutions, a unique range of **integrated technologies** for passenger mobility and cargo logistics.



... **combines hardware, software and services** to form innovative products, systems and solutions – from components through to complete turnkey solutions.



... offers new technologies **for sustainable mobility and logistics**, e.g. Controlguide<sup>®</sup>, Dispolino, Trackguard<sup>®</sup>, Sinet or adaptive, environment-oriented road traffic control, achieving **significant energy savings**.



... **optimizes infrastructures** for rail and road **by means of automation, digitization and electrification** throughout the entire value chain.

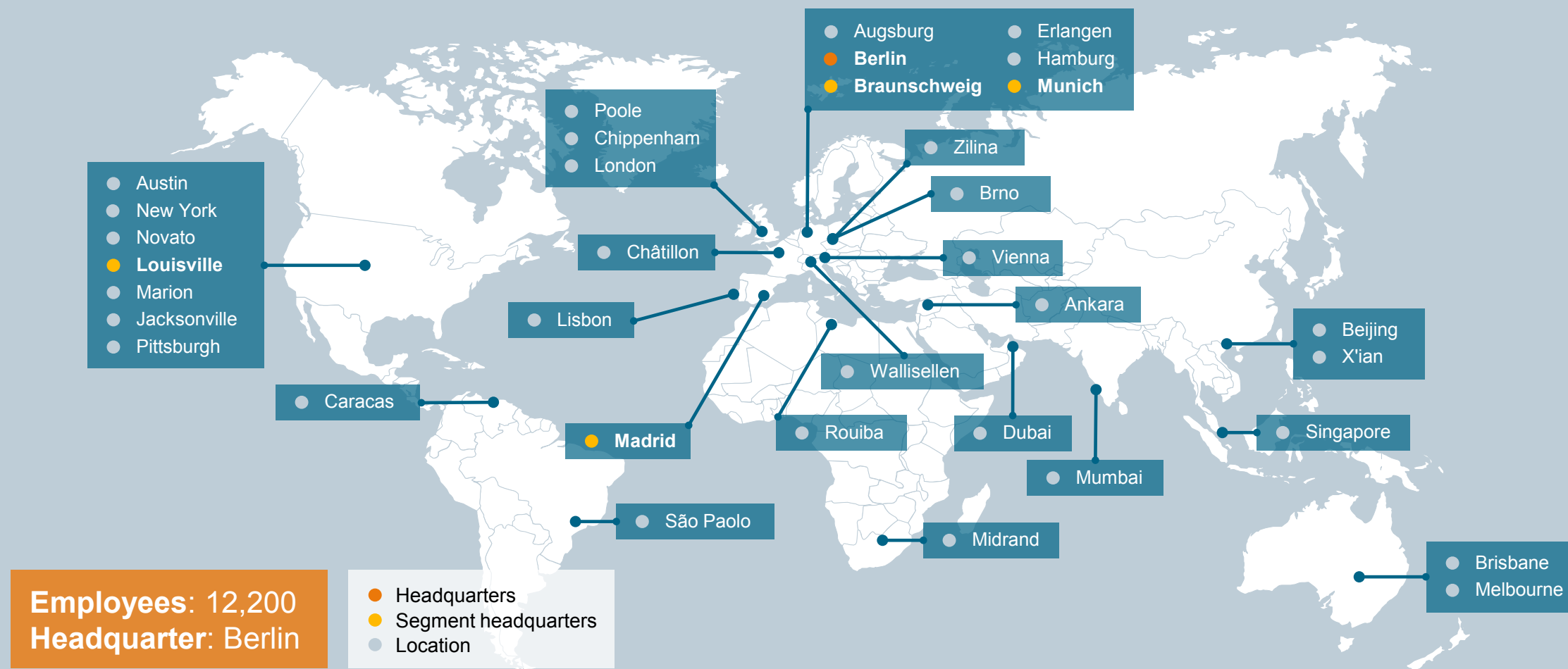


... generates **new revenue and savings potential** for cities and communities by means of flexible road usage fees and operator models for traffic management and services.



# Siemens Mobility Management

## Key Facts



# Siemens Mobility Management

## Selected References

### Spain Several high-speed lines, OBU



- High-speed trains, equipped with Siemens' ETCS on-board units
- Demonstration of interoperability with lineside equipment from different manufacturers

### UK Cross-London trains (Thameslink project)



- Cross-urban line
- Baseline 3-compliant on-board units (ETCS with ATO), integration of legacy systems

### Poland Poznan - intelligent transportation system



- Intelligent traffic control system
- Passenger information system
- Priority regulation for public transportation

### Slovakia Tolling system



- Satellite-based tolling system for nationwide truck toll collection for vehicles of 3.5 tons or more
- Easy-to-use On-Board Units
- Electronic detection, processing and billing system

### USA Commuter lines



- Upgrading boosts capacity for around 80 million passengers
- PTC train control system

### Mozambique Freight line



- The longest freight line in East Africa
- Train Sentinel PTC system, Westrace type solid-state interlockings and telecommunication system

### Saudi-Arabia Driverless subway, Riyadh



- Automatic train control and radio transmission
- Electronic interlockings
- Operations control center



## Security as part of our DNA

- Maximum level of integrity, availability, traceability and confidentiality
- Products, systems and services are developed and used in accordance with the applicable legal and normative standards
- IT security is reflected in all relevant processes and supported by adapted procedures and tools



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# Portfolio Overview

## Rail Automation



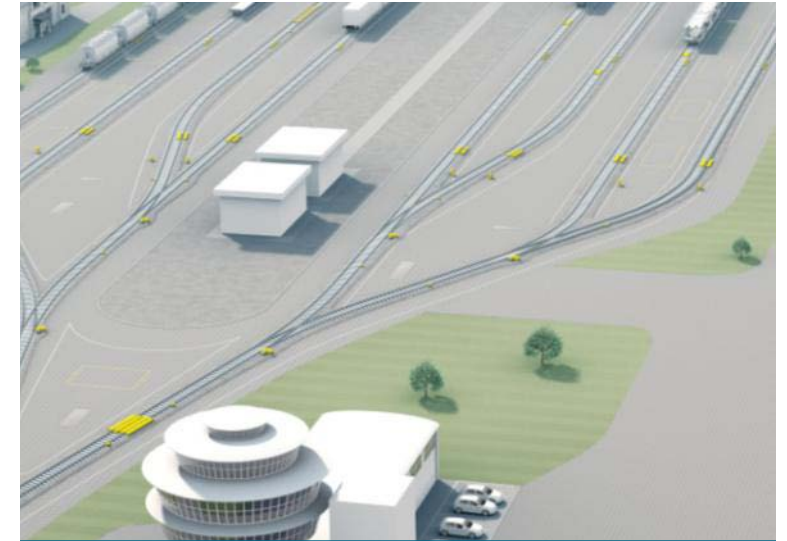
**Mainline**

Operations control and safety systems as well as products for monitoring and controlling to ensure safe and efficient long-distance rail services



**Mass Transit**

Automatic train control systems and signaling products monitor all vehicle movements to make mass transit operations efficient and cost-effective



**Freight & Products**

Rail Automation solutions for the specific needs of yards and industrial, mining and freight trains to ensure a just-in-time delivery



SIEMENS

Barrier drive

Radio-operated  
approach indicator

Grade crossing  
protection system

Operations control center

Train radio  
(GSM-R)

ETCS  
on-board unit

Compact signal

Track circuit

ETCS signal

Lineside Electronic Unit (LEU)

Euroloop

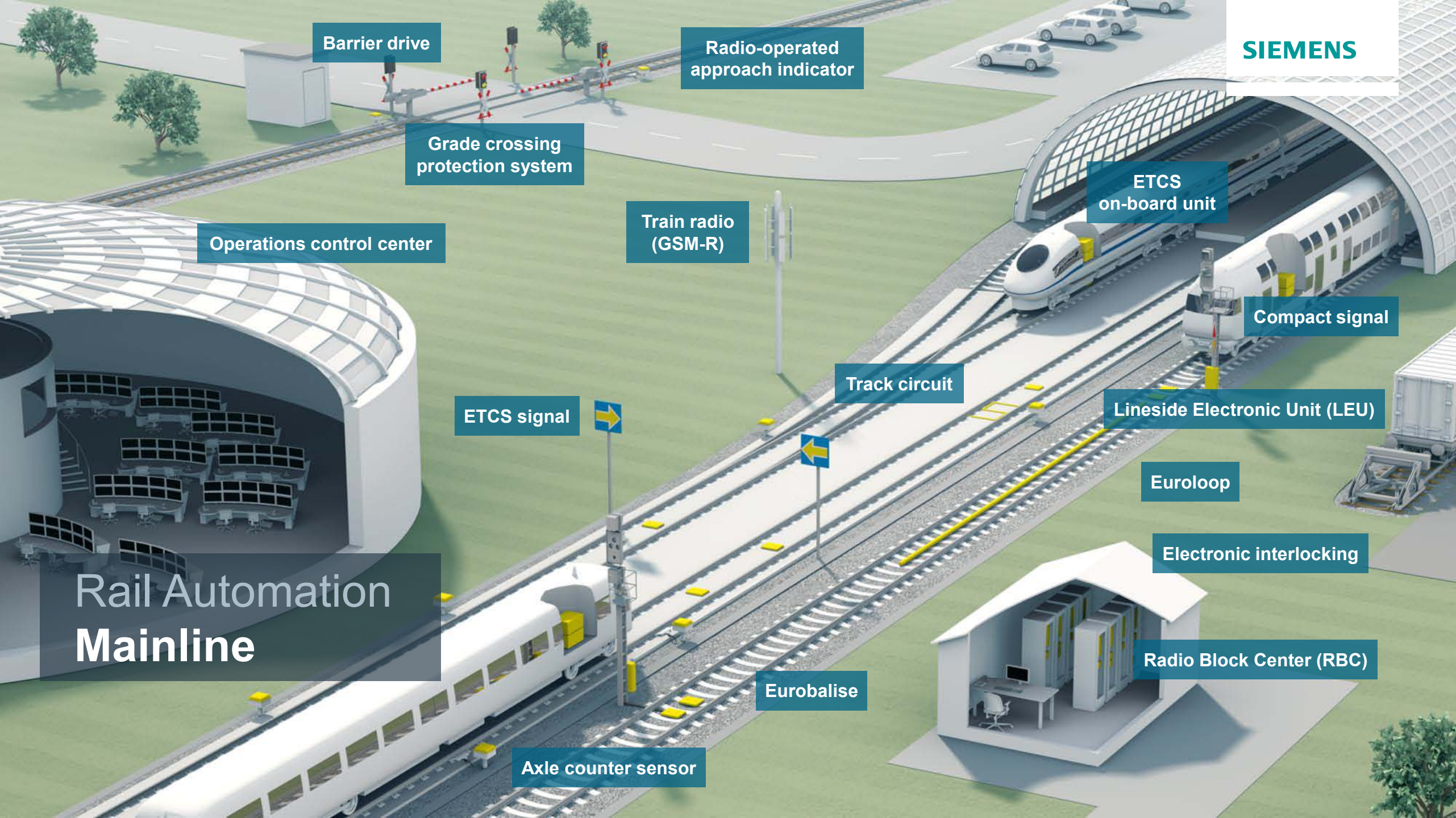
Electronic interlocking

Radio Block Center (RBC)

Eurobalise

Axle counter sensor

Rail Automation  
Mainline





SIEMENS

Operations control center

Passenger information system

CCTV

LED signal

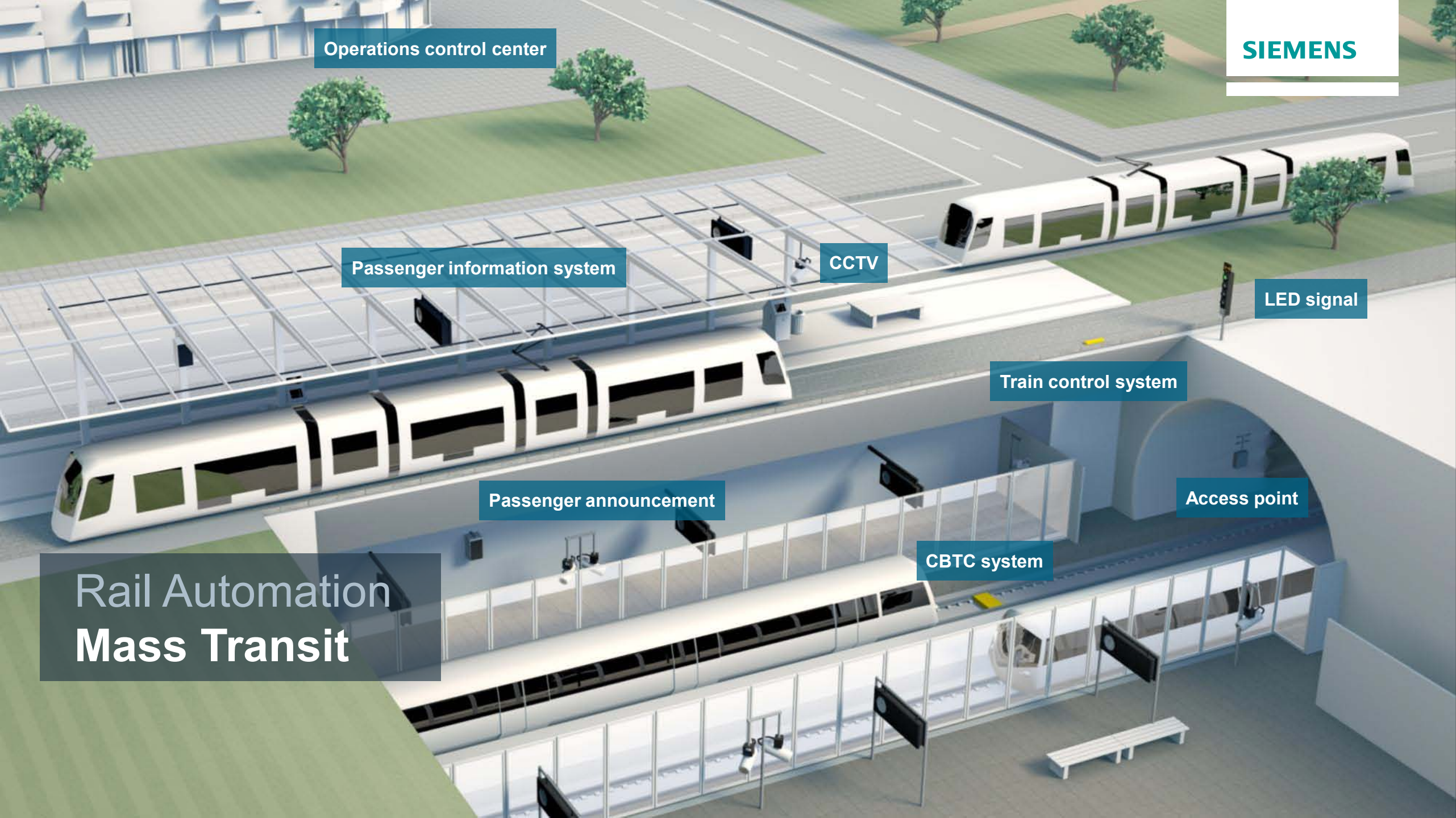
Train control system

Passenger announcement

Access point

CBTC system

# Rail Automation Mass Transit





# Rail Automation Freight & Products

Shunting hunt

Weight  
measurement

Secondary  
retarder

Point machine

Pump room

Wheel sensor

Sorting  
siding brake

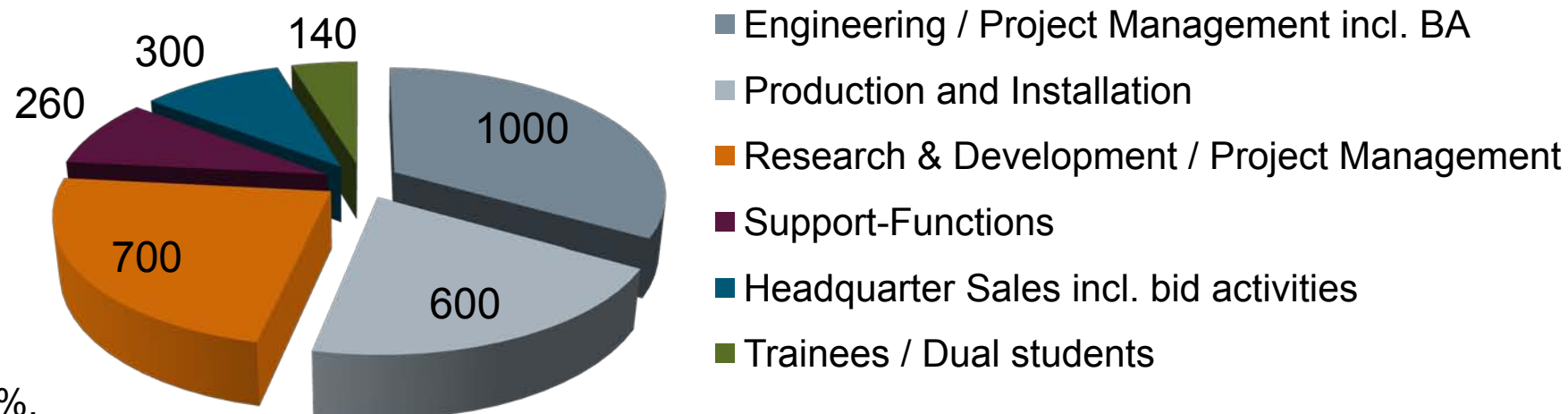
Conveyor  
mechanism

Radar

# Important facts of Siemens Mobility Braunschweig

- Established 1869, acquired by Siemens in 1928
- Worldwide largest signalling-site and with approx. 3000 employees, third largest employer in Braunschweig and biggest Siemens site in northern Germany.

- approx. 3000 employees:



Percentage of women approx. 24%.

- Close cooperation with TU Braunschweig and Ostfalia Wolfenbüttel in dual educational programs, scholarships and mutual projects.
- Important social facilities have been established at our site in recent years, such as SieKids - our company childcare and Studio Active, our fitness training center.

## Business Relevance of Siemens Mobility Braunschweig

- After acquiring Invensys Rail Siemens MO MM is clearly the market leader worldwide in Rail Automation. Rail Automation includes interlockings, train control systems, operation control systems and signalling-components.
- As largest MM-location we contribute significantly to the creation of value such as research & development / production / project execution / installation and service and thus make a major contribution to the profitable and succesful MM-Business.
- The management of the MM-Segments Mass Transit, Sales Rail Automation Germany as well as Research & Development have their headquarter in Braunschweig.
- The succesful execution of big customer orders and the succesful completion of innovation projects are the challenges for the years to come.