Urban Transport – Driver for Traffic in Cities and Digitization Opportunities
Urbanization trend in combination with need for CO₂ reduction leads to growing demand for public transport

Urban mobility is a key Siemens growth market

CAGR: Ø 2011/13-2017/19

- 4% Western Europe
- 3% Eastern Europe
+ 8% GUS
- 7% Africa & Middle East
+ 4% Asia/Pacific

Market highlights

- Growing urbanization, however approx. 200 cities with inhabitants >1 million without public transport
- Cities require efficient transportation of people and goods; ensuring urban mobility in medium to large cities is a key growth lever
- 50% of the world’s population lived in cities in 2010 and the proportion is expected to rise to 70% by 2050
- Urban population will grow from 3.5 billion to 4.7 billion by 2030
- 77% of global GDP will be generated by middleweight cities in emerging markets by 2025
- Transportation is number one topic for mayors worldwide

Source: UNIFE World Rail Market Report 2014 – Comparable MO UT Portfolio

Jakarta as example for solid urban market growth

Jakarta 1975
Jakarta 1990
Jakarta 2000
Jakarta 2010

4.8 population (million)
8.2 population (million)
8.4 population (million)
9.2 population (million)
Urban Transport answers the mobility demands of cities
Today and tomorrow

Demand

Brownfield
- Modernization and replacement of installed base
- Enlargement of fleet and network

Greenfield
- ~200 cities worldwide with almost 1 Mio. inhabitants w/o rail-bound public transport system

Portfolio

Light rail and street car, APM feeder systems, eBus charging infrastructure

Intercity-traffic

Station

City

Megacity

APM airport shuttle and link feeder systems

Metros are the core transportation systems

Airport
Our portfolio aims to meet the increasing challenges of urban mass transit transportation.
Our product portfolio covers a wide range of applications

<table>
<thead>
<tr>
<th>Metros</th>
<th>Passenger Coaches</th>
<th>Light Rail</th>
<th>Automated People Mover</th>
<th>Commuter Regionalzüge</th>
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<tr>
<td>Europe / Middle East</td>
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<tr>
<td>Inspiro Warsaw</td>
<td>Comfort railjet</td>
<td>Avenio</td>
<td>Cityval, Airval</td>
<td>Desiro ML</td>
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<td>Inspiro Munich</td>
<td>Classic</td>
<td>Avenio M</td>
<td>VAL 208</td>
<td>Desiro City</td>
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<td>Inspiro Riyadh</td>
<td>Light</td>
<td>S70</td>
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<td>Asia</td>
<td>Twin</td>
<td>S200</td>
<td>eBus Charging Infrastructure</td>
<td>Desiro RUS</td>
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<td>Bangkok</td>
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<tr>
<td>Inspiro Kuala Lumpur</td>
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<td>eBus/on-board</td>
<td>Desiro HC</td>
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<td>eCobus</td>
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### Major Order Successes and Milestones 2014 and 2015

<table>
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<tr>
<th>Project</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td><strong>San Francisco Light Rail</strong></td>
<td>175 trams + 40 option – one of the largest tram orders ever awarded in the USA</td>
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<tr>
<td><strong>Riyadh – Driverless Metro</strong></td>
<td>Driverless metro system for Riyadh, largest order from the region</td>
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<td><strong>Avenio Munich</strong></td>
<td>All eight vehicles in passenger transport operation since 2014</td>
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<tr>
<td><strong>Rhein-Ruhr-Express</strong></td>
<td>82 regional trains incl. maintenance for one of Europe's largest built-up areas</td>
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<tr>
<td><strong>Avenio The Hague</strong></td>
<td>20 additional vehicles, good customer feedback</td>
</tr>
<tr>
<td><strong>RZD – Sleeping Coaches</strong></td>
<td>Route Moscow-Nice celebrates 150th anniversary with RZD sleeping coaches</td>
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<tr>
<td><strong>ÖBB railjet Option</strong></td>
<td>Nine additional railjet trains – fleet grows to a total of 60 units</td>
</tr>
<tr>
<td><strong>eBus Infrastructure</strong></td>
<td>HPC fast-charging base for Hamburg and Gothenburg – strategic cooperation with Volvo</td>
</tr>
</tbody>
</table>
Our Competency – We can deliver Everything from One Source
No integration risk
More than 160 years of Innovation

First signaling "bell" 1847

Siemens invented the electric Tram in 1879 (Berlin)

First operational Metro System in Budapest in 1896
Avenio Qatar
Catenary-free Tramway System

- First rail project in Qatar
- 19 Avenio trams, each with three cars and able to accommodate up to 239 passengers
- 11.5 kilometers of track with catenary-free operation between stations/stops
- The system will be installed across the Education City campus and will serve 4 stations and 20 stops
- Use of a new type of hybrid energy storage system (HES)
- First Avenio has arrived in PCW for dynamic commissioning
- The scope of supply also includes signaling and communication systems, electrification as well as the depot equipment
Electric-hybrid bus for Hamburger Hochbahn
Fast-charging stations from Siemens

- Trend – mandatory commitment of numerous cities regarding emission-free inner city transportation by 2020 and 2025 respectively. Significant investments into infrastructure therefore required
- Electrification is our core business (grid connection, transformers, converters, automation etc.) and we can therefore provide the best solutions for this trend
- Concept of opportunity charging will become a norm in standard operation – because scalable (based on bus concept) and because efficiency with regard to costs and operation is a strong fact
- We are focusing on an open system (bus types / charging systems) and commit ourselves to significantly contributing towards the development of standardized interfaces between vehicles and infrastructure
- We are partners for public transport operators, cities and power companies
Future of mobility enabled and driven by digitization

Guaranteed availability

- "Life on the move" Personalized Transport
- Mobility 4.0: Autonomous driving road and rail
- Mobility on demand
- Intermodal end-to-end travel
- Mobile connectivity substitutes physical infrastructure
- Integrated intermodal hubs
- IT-based capacity maximization

Best asset utilization

- "Life on the move" Personalized Transport
- Mobility 4.0: Autonomous driving road and rail
- Mobility on demand
- Intermodal end-to-end travel
- Mobile connectivity substitutes physical infrastructure
- Integrated intermodal hubs
- IT-based capacity maximization
- Universal mobility payment and pricing
- Cooperative systems with real-time communication
- Demand-responsive rail and road infrastructure utilization / optimization
- Interconnected sensor networks for various mobility services

Enhanced passenger experience

- "Life on the move" Personalized Transport
- Mobility 4.0: Autonomous driving road and rail
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Digitization impacts our Urban Transport arena in many positive ways …

**Digitization Trends and Impacts**

- Mobility operators seeking to better utilize their assets
- Growth of share economy and "instant mobility" models
- Leveraging co-operations and partnerships
- Performance-based business models
- Vehicles and infrastructure enhanced by data analytics
- Automated mobility
- Mobile connectivity substitutes physical infrastructure
- Cloud and big data analytics enables efficient inter-modality

**Availability …**

- **Guaranteed availability**

**Throughput …**

- **Best asset utilization**

**Passenger experience …**

- **Enhanced passenger experience**

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<th>Throughput …</th>
<th>Passenger experience …</th>
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<td><strong>Guaranteed availability</strong></td>
<td><strong>Best asset utilization</strong></td>
<td><strong>Enhanced passenger experience</strong></td>
</tr>
<tr>
<td>- Predictive maintenance via</td>
<td>- Extended Operations Control System</td>
<td>- Always Connected Trams, Metros, Trains incl.</td>
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<tr>
<td>- Best-in-class Sensor Systems</td>
<td>- Conflict Resolution</td>
<td>- Media4Rail: Passenger Information and Assistance Systems</td>
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<tr>
<td>- Smart Data Analytics for Infrastructure and Vehicle Service and Maintenance</td>
<td>- Timetable Management</td>
<td>- Broadband and Entertainment Services</td>
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<td></td>
<td>- Remote Access Management</td>
<td>- Intelligent CCTV</td>
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<td>- Security</td>
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<tr>
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<td>- Conductor Information</td>
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<td>- Automated Fare Collection &quot;Be-in / Be-out&quot;</td>
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Always Connected
Solutions for seamless mobility – for passengers and operators

• In future, train connectivity will be taken for granted for individual projects
• Connectivity means that operators and passengers will have access to value-adding internet-based applications and train-related information
• In real time, displaying location, schedule, indoor and outdoor navigation, and more
• Applications based on internet connectivity generate additional revenue and reduce costs for operators
• Internet-based applications provide passengers with an internet connection in the vehicle, supplying information and real-time updates while increasing passenger comfort
Welcome to the Siemens booth at the 61st UITP World Congress and Exhibition in Milan

Fiera Milano Congressi
Hall 4 – Booth 4F 150
June 8-10, 2015