Siemens Solutions for Smarter Cities
Wendy Tao & Alex Valenti, Siemens Mobility
Siemens Mobility serves customers with solutions for cities and agencies to manage multimodal systems and improve the traveller experience

**Concert transport management system**
Integration of relevant transportation systems to create strategies for traffic management and provide information

**smartGuard**
Web-based traffic control systems – “the largest cloud-based traffic computer in the world”

**Connected vehicles**
Cooperative systems using vehicles to infrastructure communication to move beyond traffic

**Adaptive control with detectors & sensors**
Real time adaptive traffic control to learn and optimize traffic without continuous user intervention

**Intelligent street lighting**
Performance contracting and energy efficient street lighting solutions

**Rail vehicles, train systems/automation**
Modular, flexible and energy efficient rolling stock and electrification – the “driverless metro”

**eHighway**
System to supply power to electric HGVs with hybrid drives – “knows when to go electric”

**SiMobility Connect platform**
Integration of information, route planning, booking and reservation across different means of transport

**Traveler analytics**
Dashboards to interpret big data from SiMobility traveler information enabling planning, statistics, optimization

**Smart parking**
Automated and integrated on-street parking space management

**Bike and transit signal priority**
Software and integration to provide priority on the roadway to bikes and transit vehicles

**City tolling, speed enforcement**
Dynamic express lane management, enforcement solutions for bus lane and speed enforcement

**Integrated logistics and truck parking**
Truck guidance and parking for ports and logistics hubs

**Remote services & asset management**
Remote diagnostics and maintenance of rolling stock, equipment and infrastructure (asset management)
Specializing in LED street lighting, providing a true turnkey solution

Siemens ITS Energy Services team has successfully completed:

- 240,000 LED street light conversions
- 500,000 LED traffic signal conversions
- 300 street light and traffic signal maintenance contracts
- Dedicated street light project team
- 105 street light and traffic signal technicians nationwide
- $40 Million in street light energy cost savings in the last 5 years
Large scale projects implemented, some integrated with control systems

<table>
<thead>
<tr>
<th>Customer</th>
<th>Street Lights</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western Riverside Council of Governments (CA)</td>
<td>35,000</td>
</tr>
<tr>
<td><strong>Knoxville, TN (Networked Control System)</strong></td>
<td>32,000</td>
</tr>
<tr>
<td>MAPC (MA)</td>
<td>26,000</td>
</tr>
<tr>
<td><strong>Providence, RI (Networked Control System)</strong></td>
<td>16,800</td>
</tr>
<tr>
<td>Cape Light Compact (MA)</td>
<td>16,000</td>
</tr>
<tr>
<td>Huntington Beach, CA</td>
<td>11,000</td>
</tr>
<tr>
<td>City of New Bedford, MA</td>
<td>10,000</td>
</tr>
<tr>
<td>City of Manchester, NH</td>
<td>9,000</td>
</tr>
<tr>
<td>Sacramento, CA</td>
<td>9,000</td>
</tr>
<tr>
<td>San Mateo, CA</td>
<td>5,000</td>
</tr>
<tr>
<td><strong>College Station, TX (Networked Control System)</strong></td>
<td>5,000</td>
</tr>
</tbody>
</table>

- Over 50,000 additional street light conversion projects in prior years
- Maintenance and warranty contracts include active maintenance of over 70,000 street lights
ITS trends at a glance:
Disruptive changes due to ATMS / V2X, New Mobility Services and AVs

Hardware Focus

Proprietary Past | Today | Digital Future

Software/Data Focus

Function/Operations Focus

1. Traffic Management / V2X

2. Autonomous vehicles / Drones

3. New Mobility Services (MaaS)

Intelligent Traffic System Evolution over time

Increased Connectivity

Vehicle Evolution over time

Tomorrow’s Advanced Traffic Management Systems (ATMS) leveraging connectivity and data ...

1. Elementary school
   - Attention: School ends now
   - Children may cross road

2. Accident blocks road
   - Traffic jam
   - Take detour and turn around

3. Your vehicle uses electric drive
   - Free access to city center guaranteed

4. Use P+R and bus
   - for only US$2 instead of city center parking
   - 15 parking spaces available

5. Starbucks is around the corner to your left
   - Get your Frappuccino for only US$1.50
… resulting in ATMS functionalities tailored to monitor, control actively steer cities’ operational system
The Siemens Smart City platform – Concert – can be extended to support a number of applications:

- Mobility as a Service Platform
- Traffic Management
- Data and Dashboarding
- Connected Vehicle
- City Hub and Intelligent Streetlighting
Example: Traffic Controller Dashboard – Light-weight Visualization of Intersection Performance

1. Intersection Data
   - Arrivals on Red and Green
     • For whole intersection
   - Arrivals Over Time
     • Total arrivals on red, green and amber aggregated by signal group
   - Arrival Count per Detector
     • Sum of arrivals on red, green and amber for each detector
     • Shows the average per hour
   - Average Cycle
   - Average Waiting Time
     • Aggregated by signal group
   - Average Number of Detections
     • Aggregated by signal type
   - Number of Detections
     • Number of detections per detector, colored by signal
Connected Vehicle Systems
How connected vehicle works with Concert Traffic Management

- **BSM**: vehicles send location, direction, speed
  - Vehicle crash prediction
- **SPaT/MAP**: RSU sends signal states, time to change and intersection topology
  - Red light violation prediction
- **PSM**: smartphones send location, direction, speed
  - Pedestrian collision prediction

### Diagram Elements
- Sitraffic ESCoS Roadside Unit
- Concert Traffic Management
- LTE 4G / 5G
- DSRC V2I
- DSRC V2V
- Ethernet
- Wi-Fi
Dubai’s travel companion
A valuable source of mobility intelligence for RTA and its customers
The Siemens City Hub is a direct and accessible portal to engage citizens in real time information about transportation, wayfinding, and beyond.

City Hub as highly integrated product:
- Traffic data, public transportation
- Adaption to environment
- Maps and wayfinding
- Municipal communication
- Advertising/services
- Touch display
- Sensors: Proximity, ambient light, camera, …
- Data interfaces: Bluetooth, Internet, Wi-Fi
- Charging facilities
- Telephony – Emergency calling
Düsseldorf, Germany
Concert & Intelligent Street Lighting

Intelligent Streetlighting
Adaptive lighting management capabilities based on traffic volumes

-60% to -90%
Energy consumption

Construction
Time
Lighting conditions
Weather
Traffic demand
On Dim Off
Contact page

Alex Valenti
Wendy Tao

Siemens Industry, Inc.
Mobility Division
Intelligent Traffic Systems

alex.valenti@siemens.com
wendy.tao@siemens.com

www.usa.siemens.com/intelligenttraffic