Working Group of the CATRENE Scientific Committee:
Semiconductor Technologies for Smart Cities
WG Coordinator: **Joachim Pelka**, Fraunhofer Verbund Mikroelektronik

AREAS OF INTEREST

▸ Energy

▸ Building

▸ **Production and Logistics, Guido Dolmans, Holst Centre / Imec**

▸ Mobility & Transport

▸ ICT

▸ Urban Processes

▸ Safety & Security

VISIONS & STORIES

- **Production and Logistics** – *will find new ways to have production within cities and will minimize transport of goods*

- **Production and Logistics:** *Virtual factories, Remote Access, Actuator Control, New Services based on ICT*
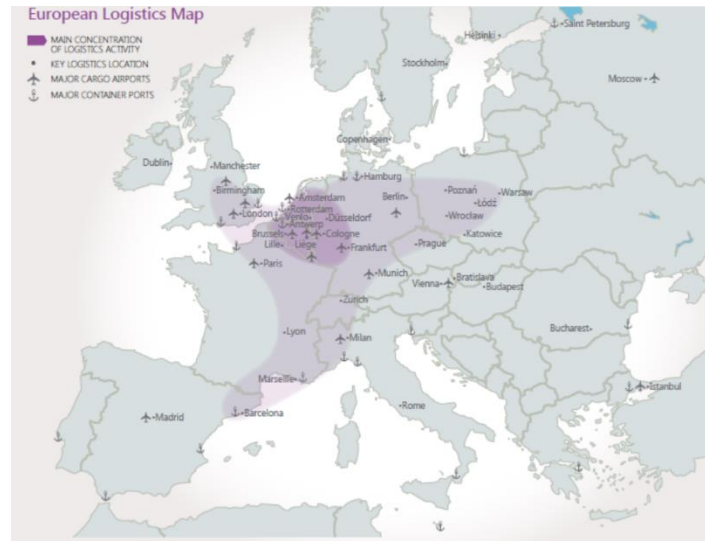
INTRO : PRODUCTION

Production and manufacturing are one of the most important contributors to EU's employment and economy. The EU industrial targets are set to:

- raising the share of manufacturing in EU GDP from 16 % in 2012 to 20 % by 2020;

- raising industrial investment in equipment from 6 % in 2012 to 9 % by 2020;

http://ec.europa.eu/enterprise/policies/industrial-competitiveness/industrial-policy/communication-2012/index_en.htm

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INTRO : LOGISTICS

Based on yearly gross revenue, the top three global third-party logistics providers (3PL) are all based in Europe. The total gross revenue of the top three companies add up to more than 70 billion in 2013. European logistic roadmap:
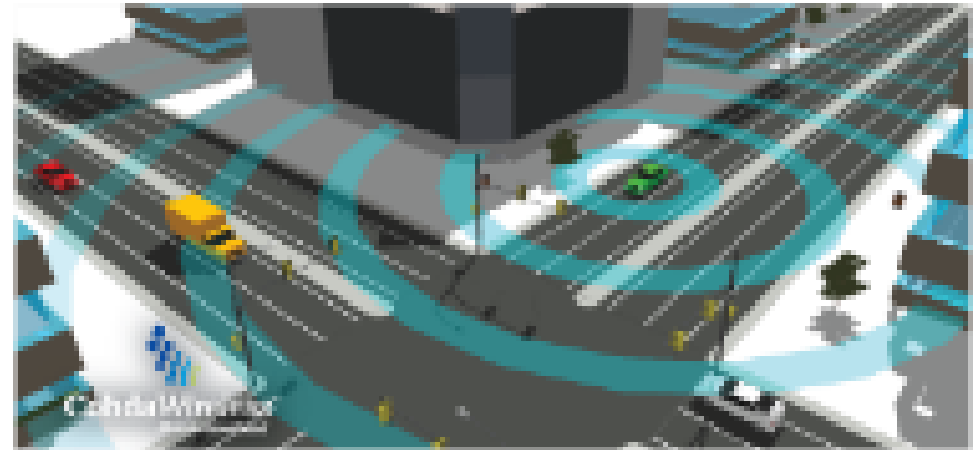

Logistics centers are distributed across the entire Europe, and are especially concentrated in Netherlands, Belgium, Germany and France.

EUROPEAN LOGISTICS & INDUSTRIAL MARKET REPORT 2014,

http://content.knightfrank.com/research/237/documents/en/*2014*-1775.pdf

Logistics: Quality and optimization of the street network

Car automation: A better street network is needed to reduce congestion, noise and environmental pollution caused by urban transportation. Another benefit is the enhanced end-customer quality of service through transport flexibility and adaptability

http://www.its.dot.gov/research/v2i.htm

http://www.voanews.com/content/vehicles-may-soon-be-talking-to-each-other-/1886895.htm

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Logistics: Quality and optimization of the street network

City parking

- Parking service on your GPS leads you to nearest & cheapest space
- Considering parking sensor data, traffic jams & dynamic zone pricing
- Coupled to pay-by-plate

Parking is 2nd/3rd highest revenue generator for cities.
- Inefficiencies cause income loss
- efficiency/mobility/ congestion

http://www.streetline.com/parking-analytics/parking-sensors-mesh-network/

Example: Streetline Inc with IoT ecosystem:
- Telefonica
- City Bank
- parking automation companies
- IBM: cloud
- Siemens: HW signage/wayfinding
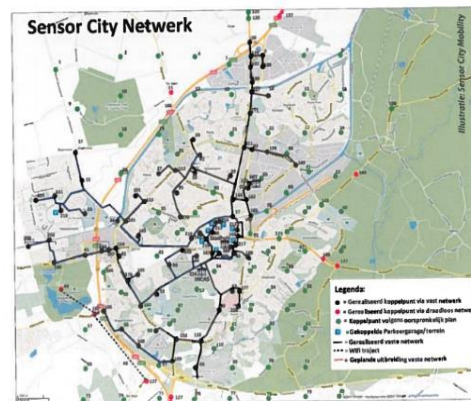- Dust networks: Wireless, 802.15.4 Mesh

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Logistics: City-compatible light, noise- and emission-reduced operations

Clean city: Several cities have sensor network trials.

Example 1: Sensors measure humidity, noise pollution, temperature, CO, NO_2 and light intensity.

Example 2: Car unit consisting of an on-board unit with GPS, accelerometers, and velocity meters. The data can be used to give a personalized advice for switching from car to public transportation.
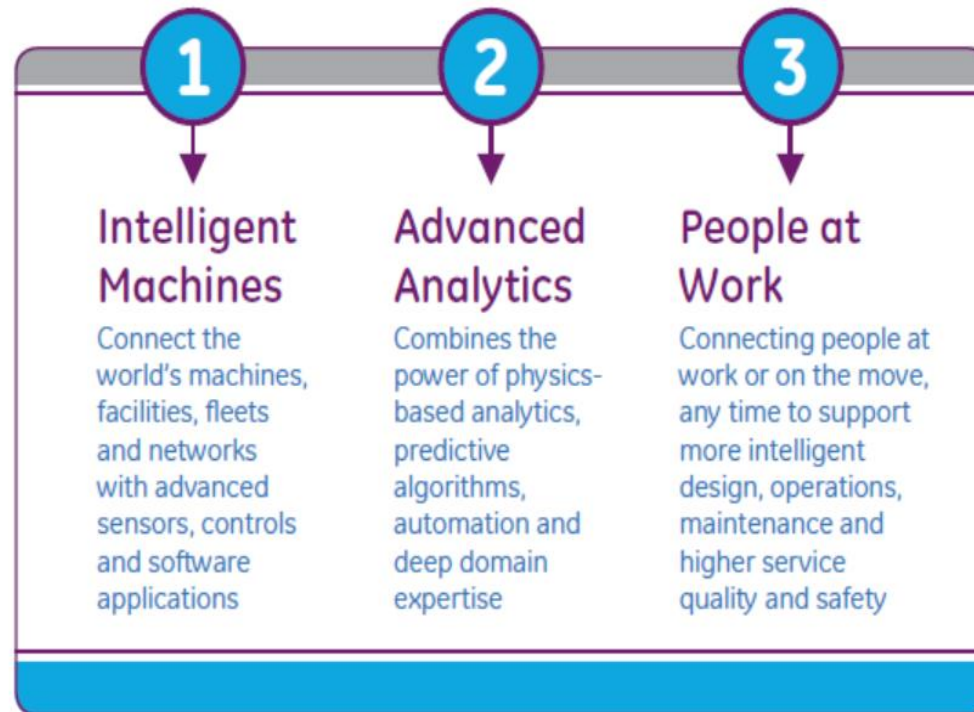
Logistics: Intelligent Street Lighting

Street lights: public street lighting that adapts to movement by pedestrians, cyclists and cars. Benefits are energy savings, maintenance cost reduction, CO_2 emission reduction, light pollution reduction, and increased safety.

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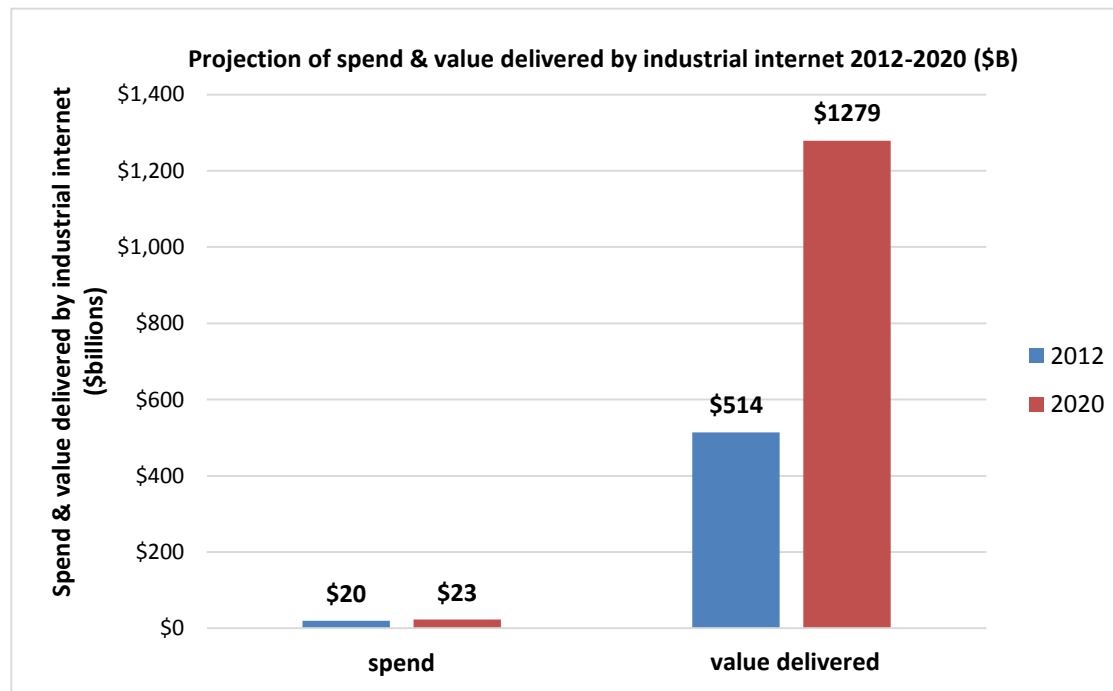# Production: Industrial Internet and Smart Factory

Industrial Internet: Massive sensing data from industrial machine and equipment are converged, and from which unique insights are extracted to set new performance standards in different industries

1 Intelligent Machines
Connect the world's machines, facilities, fleets and networks with advanced sensors, controls and software applications

2 Advanced Analytics
Combines the power of physics-based analytics, predictive algorithms, automation and deep domain expertise

3 People at Work
Connecting people at work or on the move, any time to support more intelligent design, operations, maintenance and higher service quality and safety

Peter C. Evans and Marco Annunziata, "Industrial internet: Pushing the boundaries of minds and machines", Nov. 2012

Production: Industrial Internet and Smart Factory

Industrial Internet: spending on the Industrial Internet is projected to grow from $20 billion in 2012 to about $514 billion in 2020. The value created is expected to grow from $23 billion in 2012 to about $1,279 billion in 2020

Projection of spend & value delivered by industrial internet 2012-2020 ($B)

http://wikibon.org/wiki/v/Defining_and_Sizing_the_Industrial_Internet