Digital port investments and applications to improve port service delivery

Margus Vihman

Chief Commercial Officer / Member of the Management Board

Maritime Industry Dynamics

MEGATRENDS

Larger Vessels

Cost Pressure

Digitalization and atomation

Environmental Regulation

- Security of borders and assets
- Safety of personnel
- Productivity and throughput
- Automation and process efficiency
- Collaboration with stakeholders
- Real Time Data Connectivity
- Environment monitoring & Reporting
- Customer Experience

PORT OF TALLINN

Port 4.0 is a Smart Port

DIGITAL & AUTOMATED
Fully automated operation from STS Cranes to AGV, using big data

LEARNING
Capture of data for analytics and predictive modelling

EFFICIENT
Optimised Port Of Call process coordinated with inland transport

SUSTAINABLE
Use of renewable energy Network of sensors to monitor environmental health.

INTEGRATED
Collaborative Decision Making based on single source of information

SECURE
Coastal/border security Cyber security

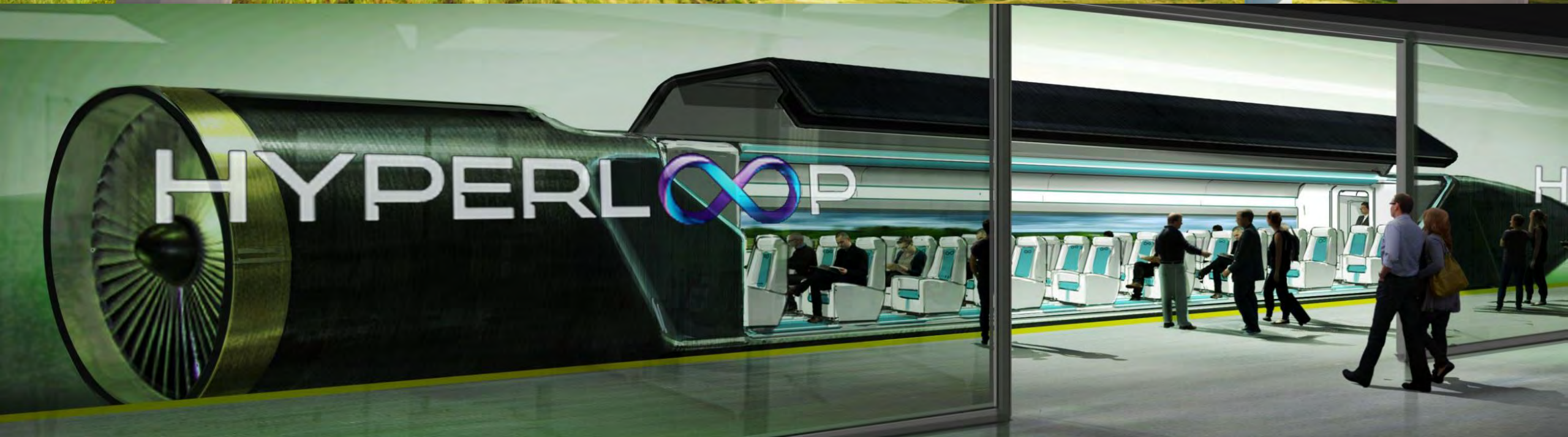PORT OF TALLINN

Maritime ICT cloud

Logistics +
e-Commerce

Logistics +
Industry 4.0

New Technologies in Logistics =
Logistics 5.0

⚓ **Our VISION:**

To become ***the most innovative port on the shores of the Baltic Sea*** by offering its customers the best ***environment*** and ***development opportunities.***

Organization
The company in a nutshell

- **Listed on Nasdaq Tallinn SE** since 13.06.2018

- Port of Tallinn is a **landlord port**

- **We provide infrastructure** – land, quays and sea approaches

- **Private operators provide superstructure:** handling equipment and warehousing

PALDISKI *SOUTH HARBOUR*
Estonia's Main Ro-Ro Harbour

Ro-Ro, general cargo, solid bulk, liquid bulk

TERRITORY	119 ha
AQUATORY	147 ha
TOTAL LENGTH OF BERTHS	1,85 km
NUMBER OF BERTHS	10
MAX. DEPTH	14,5 m
MAX. LENGTH OF A VESSEL	230 m

PORT OF TALLINN

MUUGA *HARBOUR*
Estonia's Biggest Cargo Harbour

TERRITORY	567 ha
AQUATORY	682 ha
TOTAL LENGTH OF BERTHS	6,4 km
NUMBER OF BERTHS	29
MAX. DEPTH	18 m
MAX. LENGTH OF A VESSEL	300+ m

Containers, liquid bulk, solid bulk, general cargo, Ro-Ro

PORT OF TALLINN

Logistics and transport X-Road: *Single Window*
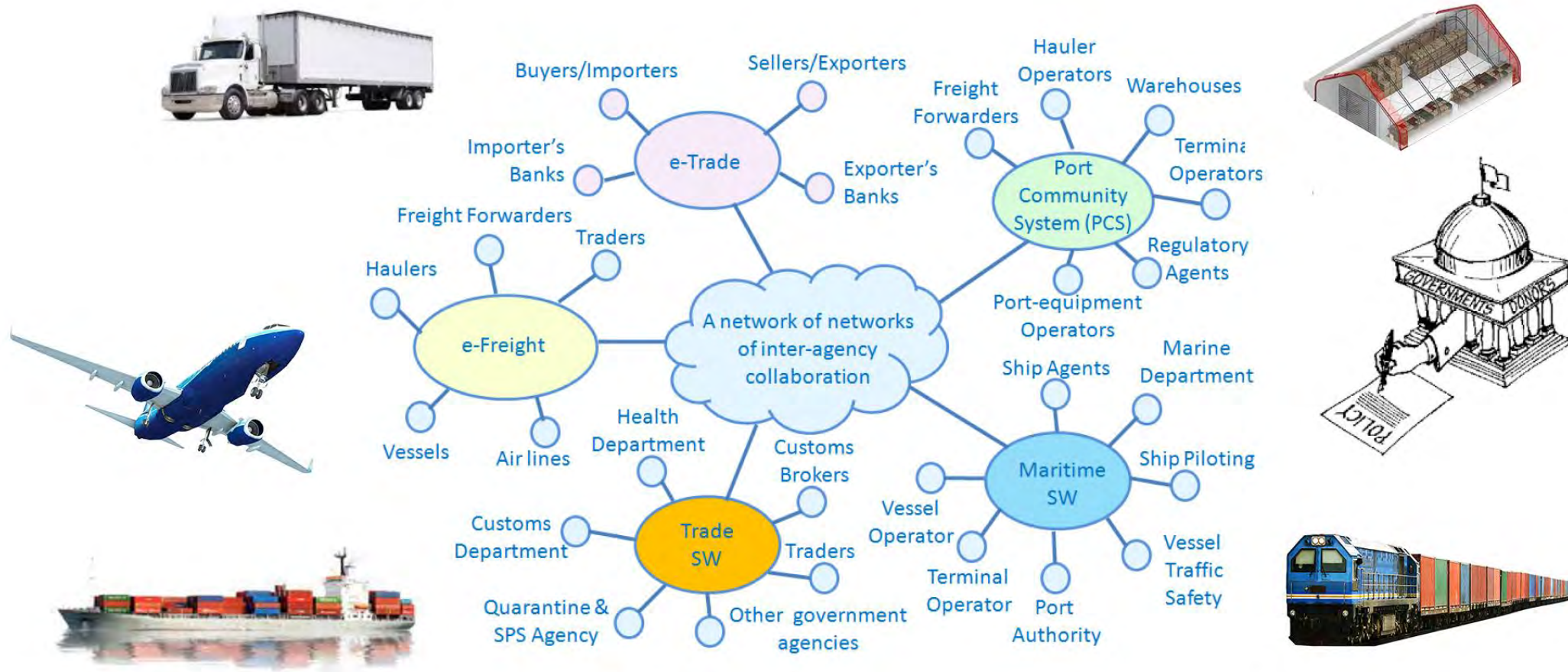
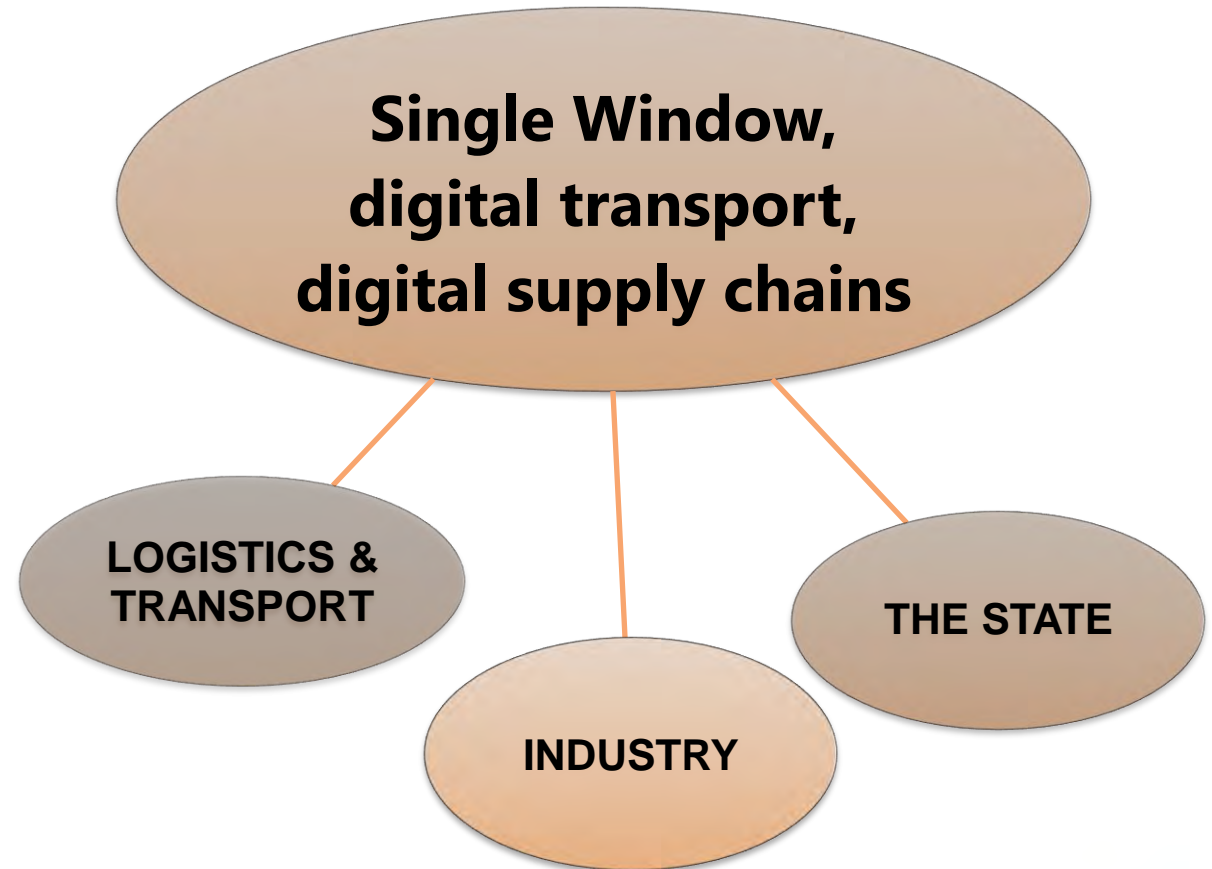# The Single Window Initiative Estonia
## Digital Transport & Logistics Cluster
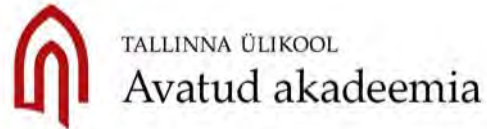
Initiative: *Aims & Actions*

- Cross-sectoral networking
- Sectoral networking
- Concept Governance
- Work on upcoming EU legislation (DG MOVE)
- Exchange of best practices
- Coordinated projects
- Prototype solutions
- Common Digital Market
- Rules and standards
- Marketing & promotion

**Single Window,
digital transport,
digital supply chains**

**LOGISTICS &
TRANSPORT**

INDUSTRY

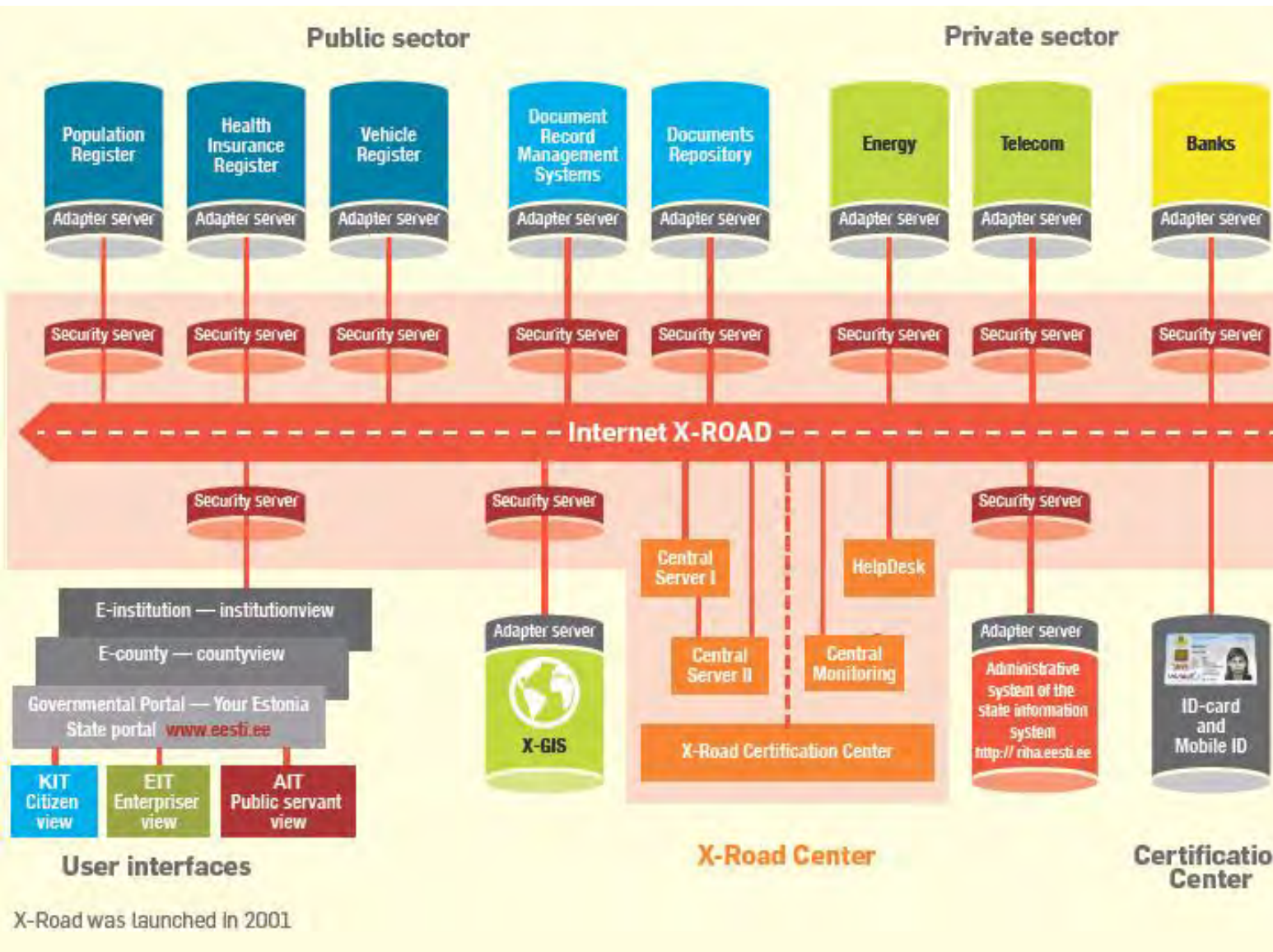**THE STATE**

PORT OF TALLINN

The Estonian *E-government Model*

- Distributed network
- Common rules of membership
- Flexibility/multiple options for information sent
- Variety of platforms, database structures
- One governance body (RIA)
- One registry (RIHA)
- E-authentication

ESTONIAN INFORMATION SYSTEM
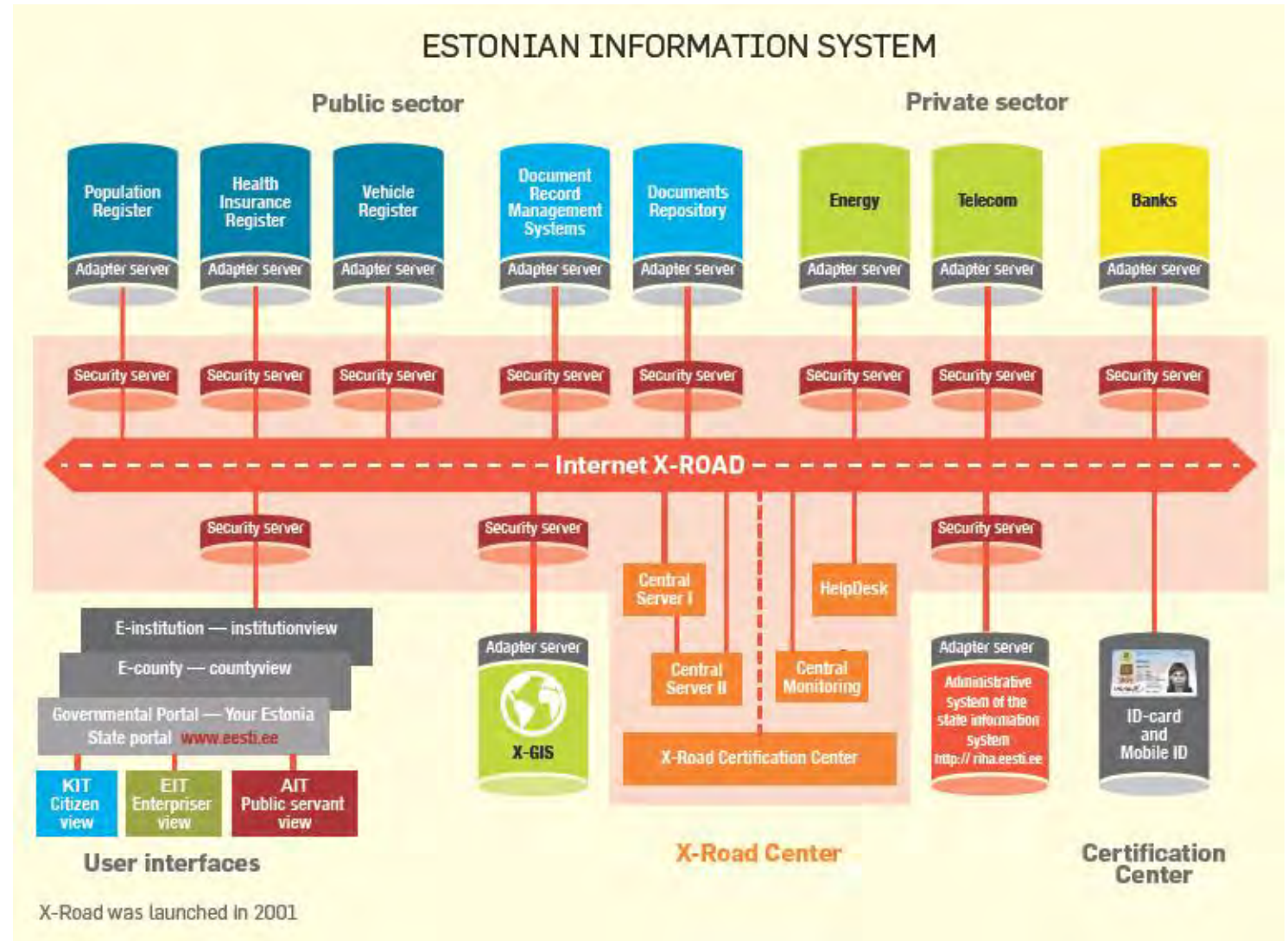
Integration

Logistics e-services &
logistics X-road
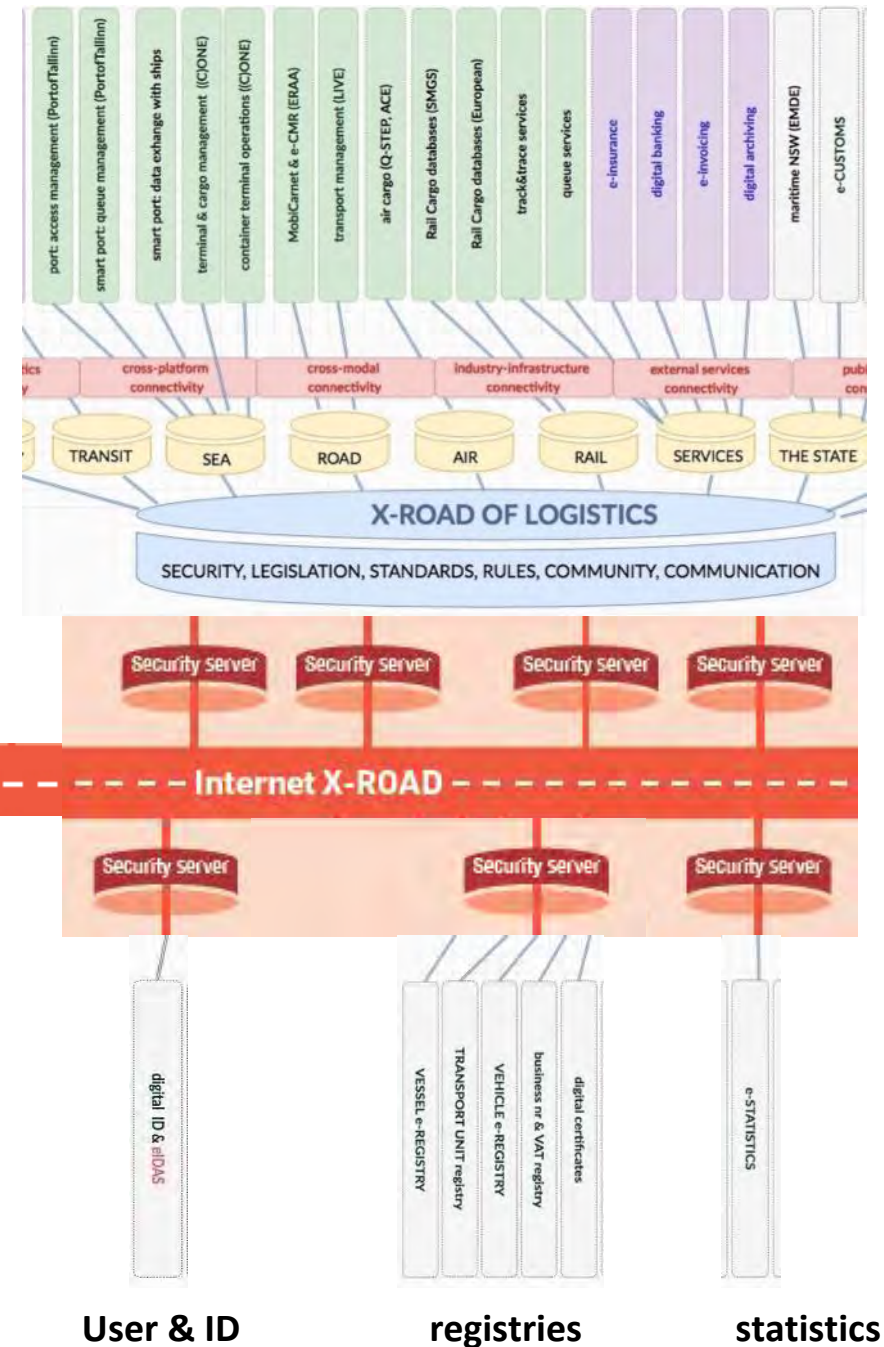
Port of Tallinn Pilot-projects

Cooperation In Single Window

1) **Digitalization of the logistic chain:**
   a joint information platform for cargo handling procedures and data processing by using the blockchain technology

2) *Smart Port* **application for trucks:**
   Queue Management Service for trucks to manage the arrival of trucks entering the port through a *Just-In-Time* process based on a virtual queue concept

Blockchain Pilot *Project*

- A trial **paperless logistical platform**

- Enables **monitoring** of loading, customs processing and pre-shipment of **export containers in real time**

- Substantially reduces **paper consumption** and **bureaucracy**

- **Pilot project** in 2017 autumn in Muuga harbour with 10 containers

SmartLog Pilot 1:
BLOCKCHAIN
Taking Logistics to 4.0

21. juuni 2017

SmartLog blockchain logistics · Interreg Central Baltic · European Union European Regional Development Fund

PORT OF TALLINN

Maritime *Single Window*

- EMDE *(Estonian Maritime Documents Exchange)* **synchronization of data on ship visits and automatic transfer of uploaded documents to the port and relevant authorities**

- Harbour Master's Department can carry out necessary EMDE procedures directly via the **Port Management Program FlexPort**

- Electronic data exchange works through **web solutions** and **XML-messages**. Also PDF-files are used as an alternatiive

- In use since **2013**
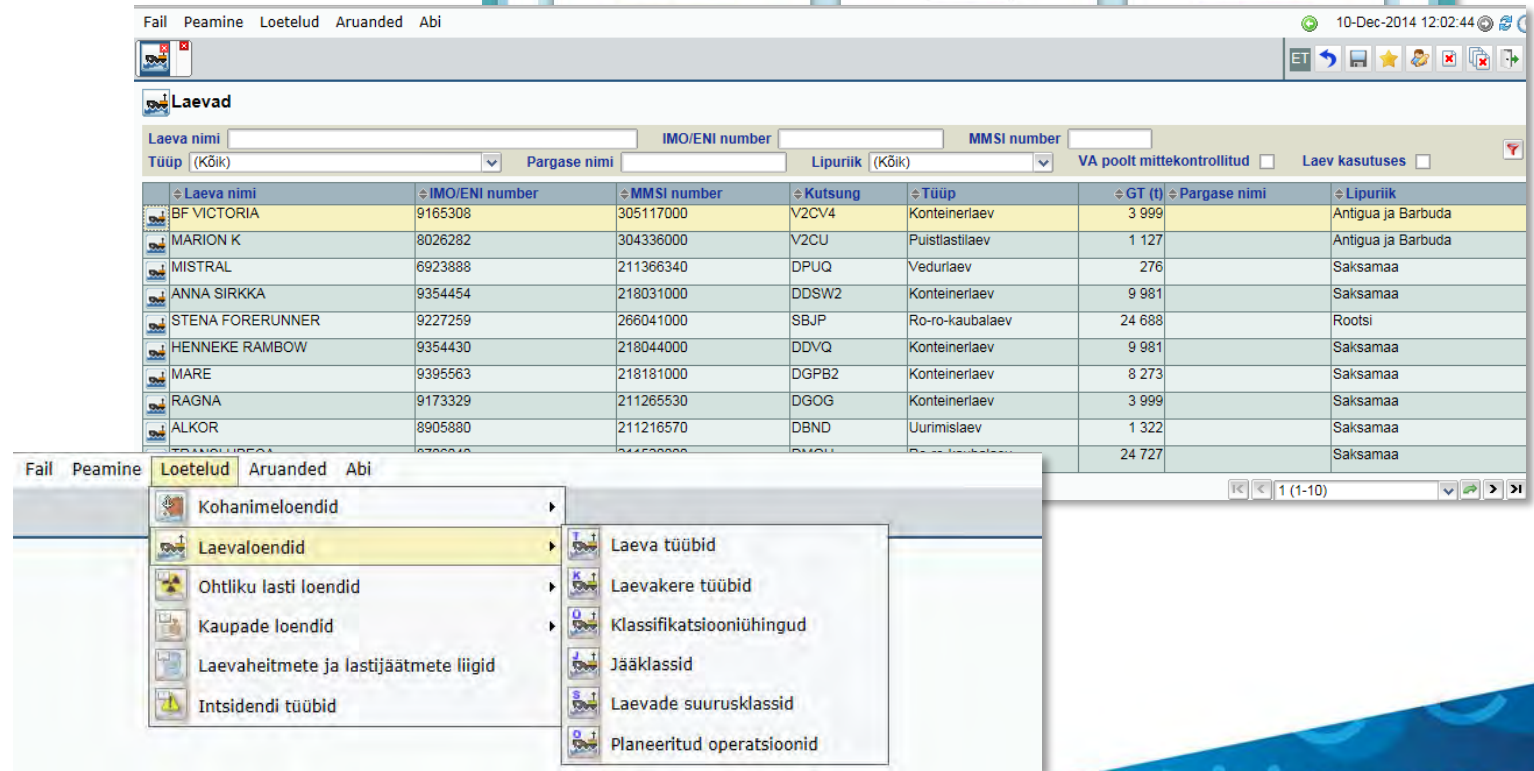
Port Administration *Program*

- **FlexPort** – port management program, which is based on enterprise resource planning platform **Microsoft Dynamics AX 2009**
- Integrates **operational data** and **financial records**
- Due to integration of different data it's also possible to display **ships' graphic placement** in the port and get **weather extracts**
- In use since **2011**

Also enables to:

- Register **vessel calls** and their **operations**
- Upload relevant **documents to every call**
- Calculate and issue **invoices**
- Get reports and **statistics**
- **Integrated** with EMDE (Single Window)
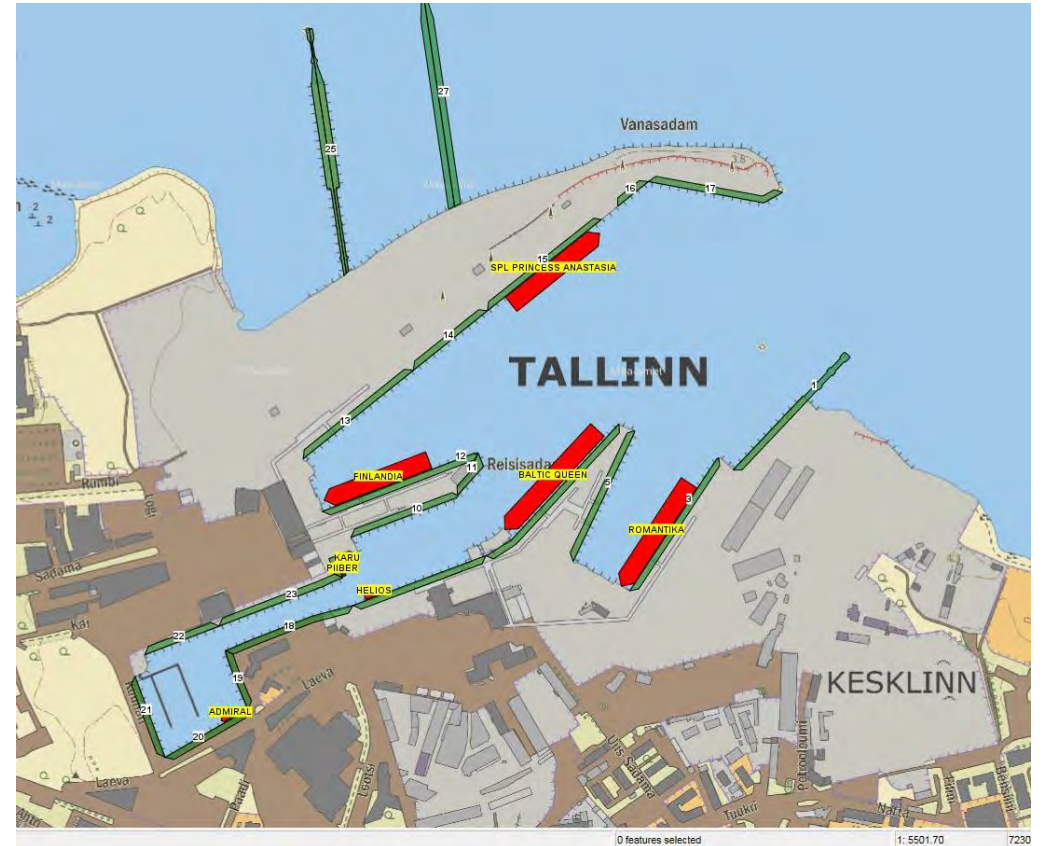
MAIRIS / e-Nose system

Monitoring air quality & detecting anomalies

- **Reducing** the risk of **odour nuisance**
- **Detecting** anomalies in air composition caused by the presence of reactive trace gases
- Getting updated info about the sources of anomalies – **24/7 online data, 1 minute frequency**
- A Network of 20 eNoses
- In use since **2016**
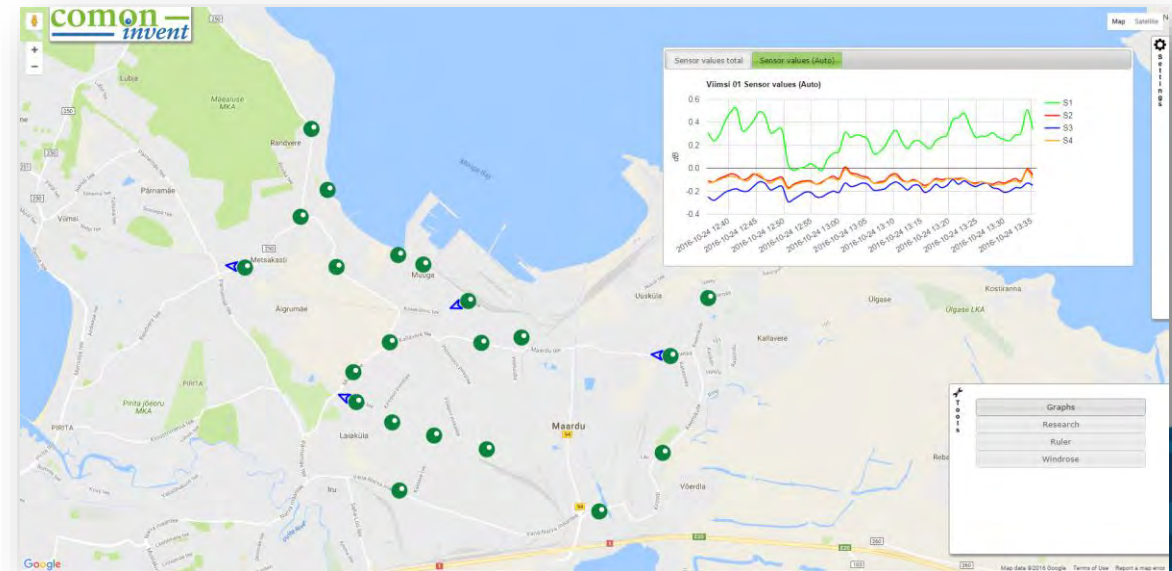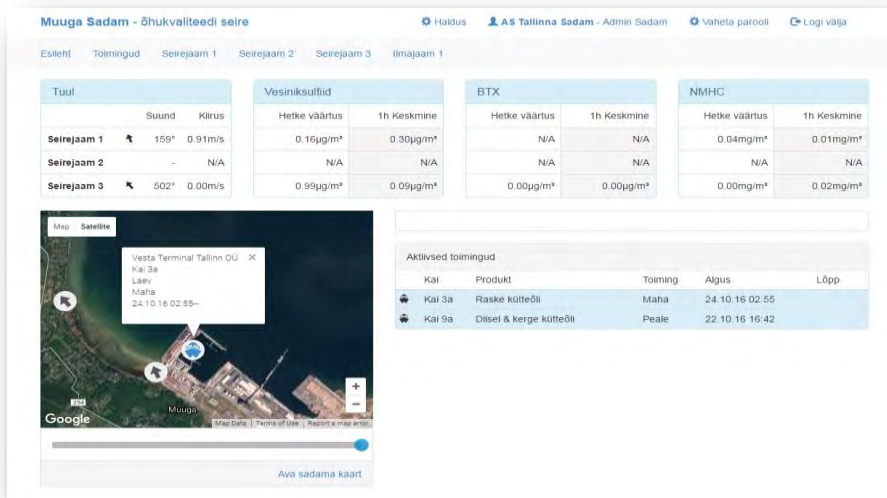
SMART PORT
for trucks

Parking lot for trucks at Tallinn border

Feasibility study and preliminary design completed

- Choosing location
- If needed, the acquisition of land
- **Virtual queue**

Project **FinEstSmartMobility**

A-entrance automatisation

Muuga Harbour

An automated entrance to Muuga Harbour

- Pre-registered trucks
- Number plate recognition
- Quicker traffic
- Communication with Customs and Tax Board system

The system ready to use – **2017**

PORT OF TALLINN

Digitalization
in Passenger Business

Old City *Harbour*
Estonia's Biggest Tourism Gateway

TERRITORY	55.3 ha
AQUATORY	94 ha
TOTAL LENGTH OF BERTHS	5 km
NUMBER OF BERTHS	24
MAX. DEPTH	10.7 m
MAX. LENGTH OF A VESSEL	340+ m

Passengers (ferries, cruises, yachts), Ro-Ro

PORT OF TALLINN

SMART PORT *Application*

- **A traffic management solution** organizing pre check-in, check-in and line management **for ports** with multiple **ferry operators** by providing holistic and easy to understand service for **passengers** with vehicles.

- Improving passenger **experience** and reducing **environmental impact.**

- Developed in cooperation with: **NORTAL** **Hansab** *it works*

- **Tight cooperation with ferry operators** – Tallink, Viking Line, Eckerö Line, Moby SPL and with **ports** of Kristiansand, Helsinki, Stockholm and other neighbouring ports.

- Fully operational since **2018**

Co-financed by the European Union
Connecting Europe Facility

Smart *Port*

For **ferry operators:**

- reduction in **waiting time** and improvement in **travel experience** of passengers

- **long-term reduction of expenses** by automated check-in (i.e. labour costs) or at least no significant increase of those expenses

- reduction or no significant increase in **loading time** of ferries

For **passengers**:

- Clear and easy to use **service**

  ✓ in check-in area
  ✓ on traffic lanes between check-in area and ferry

- Minimized **waiting time**

PORT OF TALLINN

Smart *Port*

For **port:**

- Effective **land use**

- Save **passengers' time**, door-to-door travel experience

- **Reduction of time** needed for loading and unloading of vehicles

- Efficient and flexible use of vehicle **check-in points**

- Clearer **traffic instructions** for passengers in the harbour area

- Less cars idling in the harbour area, causing less **environmental impact**

PORT OF TALLINN

Automooring