EUROPEAN CONFERENCE ON ICT
4 TRANSPORT LOGISTICS

CO-GISTICS

Sustainable deployment of cooperative ITS for logistics - Evaluation

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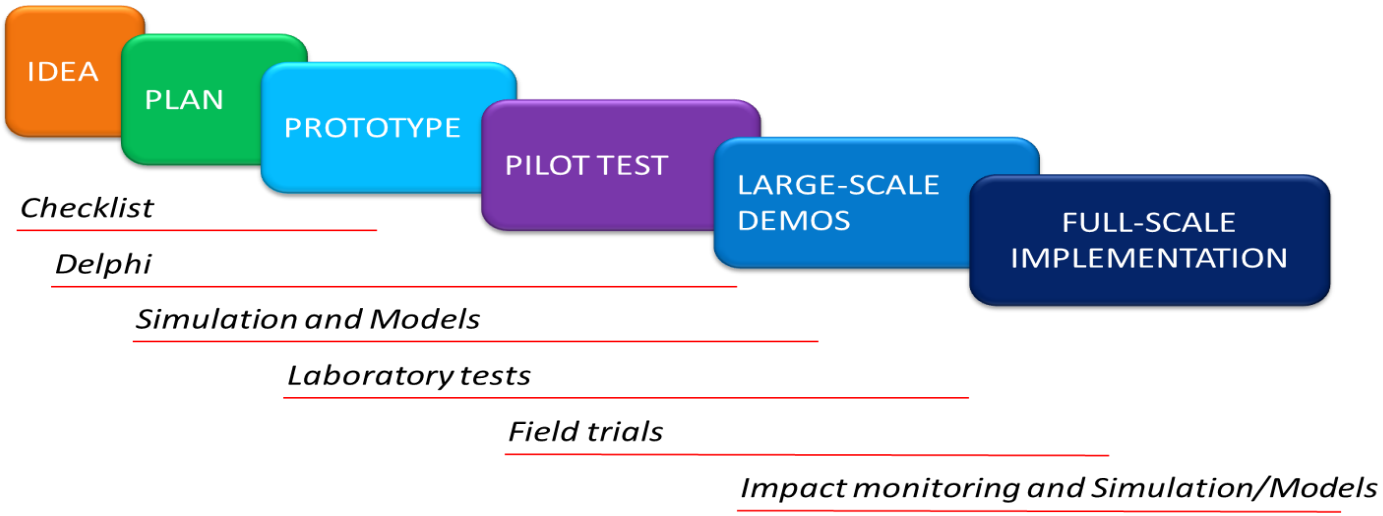
Why Evaluate ITS & C-ITS?

- Evaluation is the process of determining the value, the importance and the quality of a thing, of a process and of a project based on predetermined criteria.
  - Understand the impacts
  - Quantify the benefits
  - Help make future investment decisions
  - Optimize existing system operation and design

Field operational tests

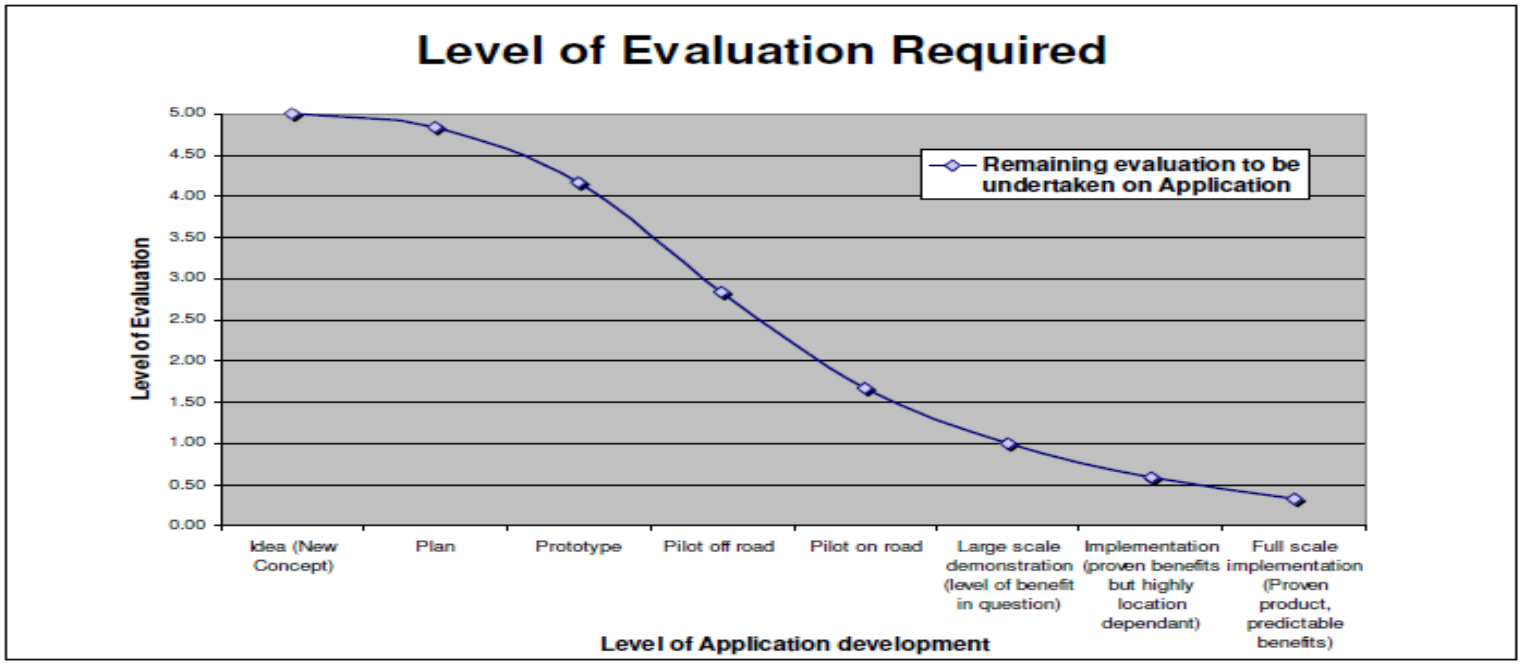


Source: EEG TEMPO Euro-Regional Evaluation Guidelines, 2005

The EasyWay project proposes the following classification of Field Operational Tests (FOTs):

- Pilot project: **technical focus** on meeting the specifications on a wide area
- Implementation project: evaluation of **socio-economic impacts** of the proposed solution
- Demonstration project: focus on **scalability** combining the above two categories

Field operational tests



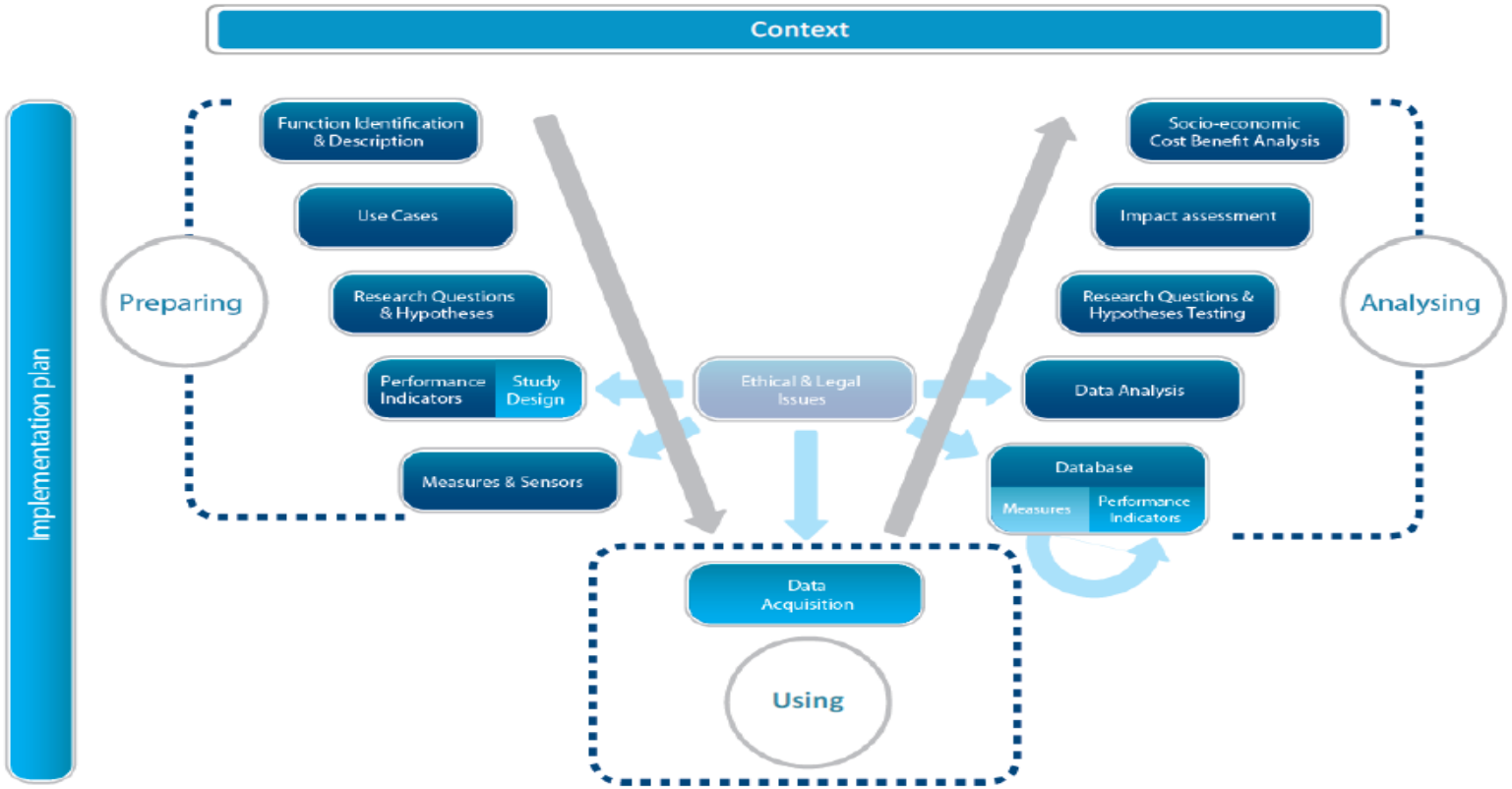
Source: EasyWay Euro-Regional Project Evaluation Guidelines, 2005

Evaluation framework of COGISTICS

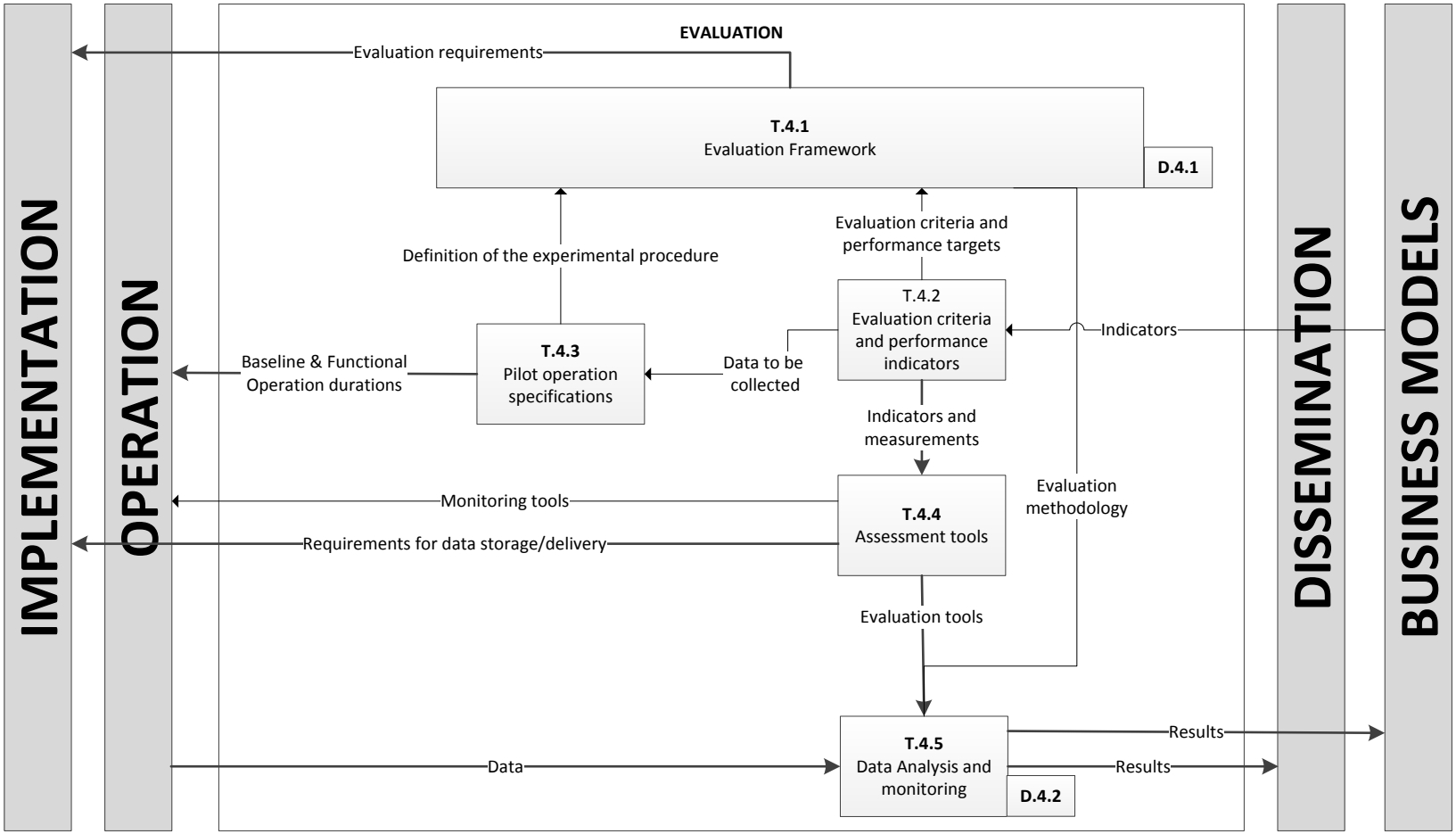
- FESTA (FREILOT, COMPASS4D)
  - Research questions, hypothesis, indicators, measurements
- AMITRAN
  - Methodologies for CO2 emissions estimation
- TRADITIONAL TOOLS
  - CBA, CEA, MCA
- **DESIGN SCIENCE (innovative products)**
  - **Functionality, completeness, consistency, usability**
- **AGILE APPROACH**
  - **Customer oriented design (flexible)**

Evaluation framework of COGISTICS

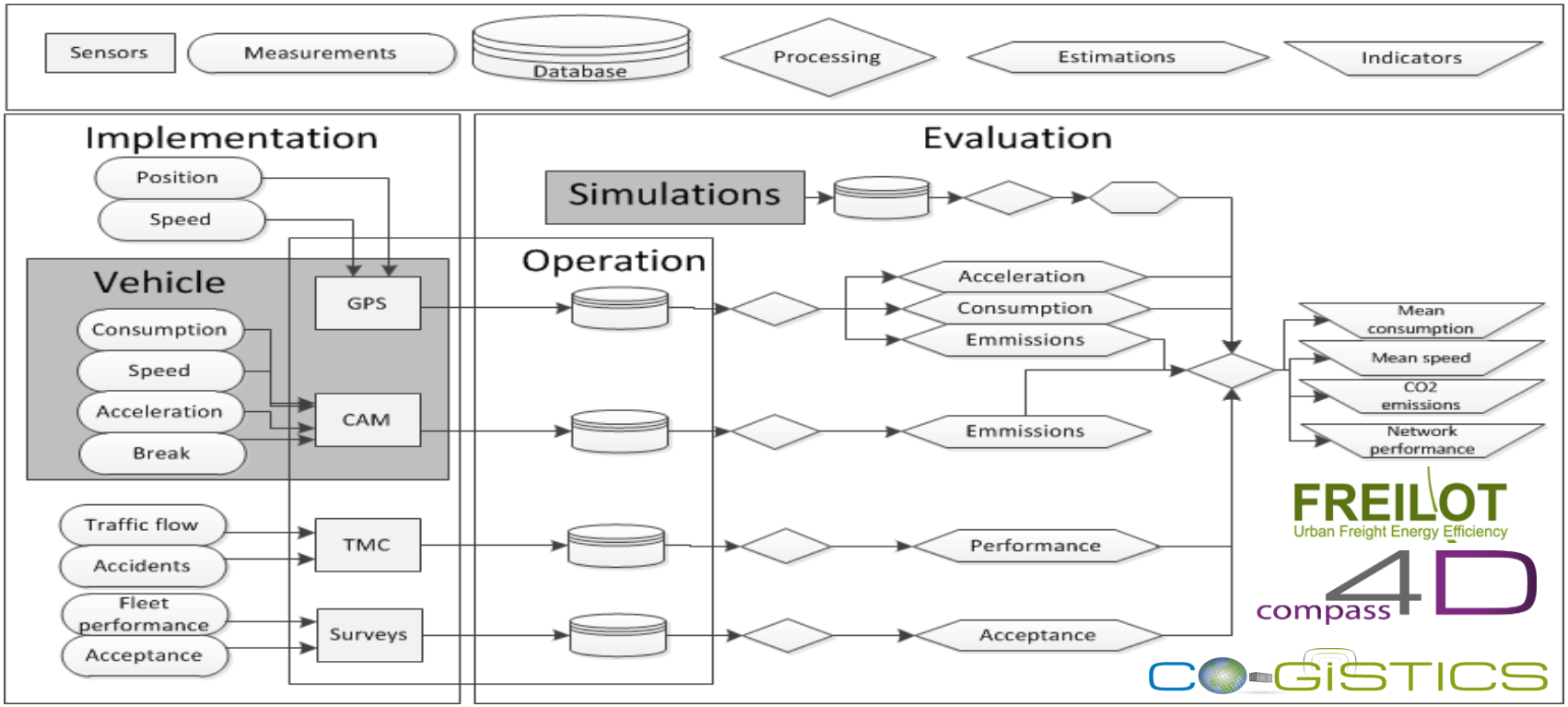
- FESTA (FREILOT, COMPASS4D)



Evaluation within the project



Evaluation within the project



Lessons learnt

- Problem: Large variability of results (due to the assumptions)

12% 31% 41% 48% 47% Energy savings

0%

12%-14% 56% Reduced emissions

0%

56%

Research team	Significant assumptions
Mandava S., Boriboonsomsin K., Barth M. (2009)	Light traffic conditions
Li M., Boriboonsomsin K., Wu G., Zhang W.B., Barth M. (2009)	Two consequent signalized intersections
Barth M., Mandava S., Boriboonsomsin K., Xia H. (2011)	Signalized arterial
Xia H., Boriboonsomsin K., Barth M. (2013)	Medium demand and low user penetration rates
Barth M., Boriboonsomsin K. (2009)	Real world experimental run
Vreeswijk J.D., Mahmod M.K.M., van Arem B. (2010)	Adaptive balancing and control system
Schuricht P., Michler O., Bäker B. (2011)	Very low traffic conditions
Asadi B, Vahidi A. (2011)	Integration of dynamic eco-driving into adaptive cruise control

Lessons learnt

- Need to define evaluation “standards”
  - Road type (arterial, urban, interurban)
  - Geographic extent (urban area, route)
  - “Network” characteristics (spacing, cycle time)
  - Congestion (high, medium, low, very low)
  - Penetration (infrastructure and vehicle side)
  - Service(s) logic (“hand made”)
  - Simulation algorithm (traffic + fuel/emissions)
- Need for standardized test beds

Lessons learnt

- Early evaluation results based on simulations should be taken into account during the implementation of the ITS
  - The System will collapse if provided during peak hours
  - Priority can be provided to up to *x* trucks
  - Distance between intersections should be larger than *x* m
  - Scaling issues
- Monitoring is fundamental (early detection of problems)
  - Technical issues
  - Organization issues
  - Operation issues

Lessons learnt

- Do not forget the aim of the service (society, profit, environment)
- Stakeholders commitment should be achieved from the start of the project (self-sustainable services)
- Standards should be used, but not always will be available (one step forward)

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Thank you for your attention!