

INTERMODEL EU

Simulation using Building Information Modelling Methodology of Multimodal, Multipurpose and Multiproduct Freight Railway Terminal Infrastructures

Grant agreement: 690658

MINUTES 2nd GLOBAL MEETING 20-22 September 2017 Espoo

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1 Agenda

The meeting was held in VTT Technical Research Centre of Finland, Otaniemi, Espoo (Finland).

1st day: 20th September 2017 (Wednesday)

Morning

Address: Vuorimiehentie 3, Otaniemi, Espoo (**Place 1**)

Afternoon

Address: Tekniikantie 4A, Otaniemi, Espoo (**Place 2**)

2nd day: 21st September 2017 (Thursday)

Address: Tekniikantie 4A, Otaniemi, Espoo (**Place 2**)

3rd day: 22nd September 2017 (Friday)

Address: Vuorimiehentie 3, Otaniemi, Espoo (**Place 1**)

1.1 First Day Agenda (Project WP meetings and workshop for integrated multimodal terminal planning)

Wednesday 20th September 2017

Arrival of partners at the meeting venue around 08:45

Address: Vuorimiehentie 3, Otaniemi, Espoo (**Place 1**)

Starting: 09:00 – Ending: 18:00

1. Welcome act (9.00 – 09.10)

2. Presentation of the event and agenda items (09.10 – 09:30): IDP

- Presentation of the event and agenda items.
- Make clear the objectives of the event and its activities.

3. Project Overview (9:30 – 10:00): IDP

- Project overview – status
- Understand the main project issues, changes from the envisaged plan, objectives, risks and opportunities, if any
- Selection of topics for workshops and internal discussions

4. Project Administration and Management (10:00 – 10:30): IDP, F-Iniciativas

- Provide information and discuss:
 - Amendment needed (aspects to consider: change of name of La Spezia Port Authority; CIMNE-CENIT; inconsistencies found in the Description of the Action, DoA) (IDP & F-Iniciativas).
 - Mid-term technical and financial report. (IDP & F-Iniciativas).

COFFEE BREAK 10:30 – 11:00

5. WP2: Integrated planning environment and decision support overview (11:00 – 11:30): VTT

- Presentation 20 minutes + 10 minutes for open questions

6. WP3: Data & Indicators definitions (11:30 – 12:00): FGC

- Presentation 20 minutes + 10 minutes for open questions

Walk to other venue place 12:00-12:15

Address: Tekniikantie 4A, Otaniemi, Espoo (Place 2)

7. Introduction to ‘VTT Creation Lab’ virtual space (12:15 – 12:30) – VTT

- More information:

http://cic.vtt.fi/creationlab/VTT_Creation_Lab/In_English.html

LUNCH 12:30– 13:30

8. WP4: BIM Intermodal Terminal (13:30 – 14:00): IDP

- Presentation 20 minutes + 10 minutes for open questions

9. WP5: Terminals Operational Simulations (14:00 – 14:30): MAC

- Presentation 20 minutes + 10 minutes for open questions

10. Workshop for integrated multimodal terminal planning (14:30 – 15:30) IDP, MAC, VTT & VIAN

- Intermodal terminal model, operational simulation and Indicators in evaluation of terminal performance. Presentation between WP2, WP3, WP4 and WP5.
- Materials are presented at **TEN-T Days Tallinn**

COFFEE BREAK 15:30 – 16:00

11. Summary – Workshop for integrated multimodal terminal planning (16:00 – 16:30): IDP, MAC & VTT

- Summary, findings from discussions and conclusions

12. WP6: External Mobility Effects (16:30 – 17:00): CENIT

- Presentation 20 minutes + 10 minutes for open questions

13. WP7: Interconnection Simulations (17:00 – 17:30): MAC

- Presentation 20 minutes + 10 minutes for open questions

14.WP8: Functional, economic and environmental analysis (17:30 – 18:00): DHL + CENIT

- Presentation 20 minutes + 10 minutes for open questions

1.2 Second Day Agenda (Group discussions and company visit / social program)

Thursday 21st September 2017

Arrival of partners at the meeting venue around 08:45

Address: Tekniikantie 4A, Otaniemi, Espoo (**Place 2**)

Starting: 09:00 – Ending: 15:30 (+transportation to social dinner)

15. Workshops and internal discussions (9:00 – 10:30)

45 minutes per topic

- Topic 1: Planning in integrated multimodal terminals
- Topic 2: Simulation in integrated multimodal terminals
- Topic 3: Case studies and scenarios

09:00 – 09:45 Topic 1

09:45 – 10:30 Topic 2

COFFEE BREAK 10:30– 11:00

16. Workshops and internal discussions (11:00 – 11:45)

11:00 – 11:45 Topic 3

17.WP9: Exploitation, dissemination and communication (11:45 – 12:30) – IDP & ZNIK

- Presentation 10 minutes
- Discussions 35 minutes

Dissemination and communication

- Intranet – how used to share confidential information
- Media - web site, twitter, LinkedIn, YouTube videos etc.
- e-Newsletter
- Publishing: conference and papers etc. potential topics

Exploitation

- Exploitation agreement draft (already sent to all partners)

LUNCH 12:30 - 13:30

18. Further discussions and company visit (13:30 – 15:30)

SOCIAL DINNER (TRANSPORTATION PROVIDED)

Place: Hotelli Lepolampi, Nuuksio national park. <http://lepolampi.fi>

1.3 Third Day Agenda (Close up & Upcoming work)

Friday 22nd September 2017

Arrival of partners at the meeting venue around 08:45

Address: Vuorimiehentie 3, Otaniemi, Espoo (**Place 1**)

Starting: 09:00 – Ending: 11:00

19. Consolidation and Closing (9:00 – 11:00): IDP

- **Activity:**
 - Consolidation of tasks, responsibilities and deadlines
- **Objectives:**
 - Summary of the key results at this point
 - Upcoming work in next 6 months
 - Define the next meeting date in consensus.
 - Resolutions and closure of the meeting.

CLOSING COFFE BREAK

2 Participants

NAME	INST.	Attended 20/09/17	Attended 21/09/17	Attended 22/09/17
Cornelis Versteegt	MAC	YES	YES	YES
Dayla Villani	APSP	YES	YES	NO
Simone Pacciardi	APSP	YES	YES	NO
Jose Robiou	IDP	YES	YES	YES
Gisela Soley	IDP	YES	YES	YES
Pietro De Michieli	BED	YES	NO	NO
Miguel Ángel Dombriz	FGC	YES	YES	NO
Àlex Calvo	BASF	YES	YES	NO
Carles Cots	BASF	YES	YES	NO
Manuel Menéndez	VIAS	YES	YES	YES
Francisco Rodero	CENIT	YES	YES	YES
Pau Morales	CENIT	YES	YES	YES
Eleonora Casiraghi	CSI	YES	YES	NO
Joachim Ritzer	DHL	YES	YES	YES
Donata Strycharczyk	ZNIK	YES	YES	NO
Jarkko Sireeni	VIASYS VDC	YES	YES	YES
Zarrin Fatima	VTT	YES	YES	YES
Ville Hinkka	VTT	YES	YES	NO
Juha Hyvärinen	VTT	YES	YES	NO
Janne Porkka	VTT	YES	YES	YES

3 Discussions/decisions about each agenda item

FIRST DAY, 20/09/2017

1. Welcome act and presentation of the event and agenda items

- The meeting was opened by Gisela Soley as project manager and representative of IDP.

2. Project overview

- Gisela Soley made an overview of the INTERMODEL project focused on what has been done during the first year, the deliverables submitted, approved, pending for approval and the ones with a new deadline due to comments received from the EC, the work that has to be done during the next 6-month period and deliverables to be submitted by February 2018, and what is expected from each partner.
- It was agreed that in order to organize the work within a work package, WP leader would e-mail to all partners involved. Also there will be an on-line meeting once a month among all partners to inform about the progress in each work package.

3. Project administration and management

- Gisela Soley informed about the need to do an amendment due to the change of name of La Spezia and because of the merger between CIMNE and CENIT. Taking advantage of this need, we should also include the inconsistencies found in the Description of the Action (DoA) at the beginning of the project (the PO was informed at that time), and update CENIT's and DHL's efforts under WP8.
- A work plan was proposed with the aim of presenting the amendment by the end of November.
- The presentation continued reminding that after February 2018, the Consortium will have to submit the mid-term technical and financial report.

4. WP2 Integrated planning environment and decision support overview

- Janne Porkka, from VTT, provided a general overview of the work package, explained the work done during the first year of the project and immediate objectives for the next 6 months, and identified any changes from the envisaged plan, risks and opportunities.

- Key issues: how to combine the BIM model; how we should integrate simulation and models; how to design the interface.
- Challenges: define the level of integration between simulation and modelling; different levels of detail when showing KPIs (could end-users choose which indicators they want to analyze?; how will the interface show the results obtained?.
- Discussion on how to connect the simulation and Viasys software.
- Important to define who the final user is. According to this, you will design high-level and more detail planning.

5. WP3 Data & Indicators definitions overview

- Miguel Angel Dombriz, from FGC, explained goals and main results of this work package that was completed in August 2017.
- Discussion again about possible problems when calculating KPIs. In that case, a solution will be reduce the KPIs list explaining the reasons and justifying.
- *From the first meeting in Kiruna:* Discussion about improvements and innovations to be implemented. Some of the improvements proposed could be too difficult to implement in case of a low level of detail. Possible difficulties for the inclusion of Internet of Things in the case studies. However, Joachim Ritzer, from DHL, and other partners suggest including maintenance, delays on trains, handling, temperature control or pre-planning, as Internet of Things cases. Considering problems and difficulties when simulating, Joachim Ritzer advised to simplify the concepts and to tell how the overall platform can handle these scenarios and to model only a few.
- Challenges: how we are going to integrate the results of WiderMOS within the model of La Spezia. Meeting will be held between IDP and Circle to understand better the CMP and see how this could be integrated in the model.
- Key issues: which are the real pilot cases and which are the virtual ones? Are the real cases the current terminals or current terminals including innovations and improvements?; Are virtual cases imaginary terminals including bulk and cold chain besides container, as proposed in the Description of the Action (DoA)?. How are we going to validate the indicators obtained from the virtual cases?. When talking about bulk terminals, some important things to considered, as stated by Pietro from Bedeschi, is that bulk terminals can vary a lot according to different commodities, as they will require different handling, they will have a

different environmental impact, etc. It is really difficult to design a 'general' bulk terminal.

6. WP4 BIM intermodal terminal overview

- Jose Robiou, from IDP, explained main progress done under BIM modelling, and the importance of mapping the data/information, and the work flow between business analysis, design consultancies, engineers, software developers, etc.
- Discussion on formats for simulation and BIM coupling. QGIS has been used for modelling real terminals and export the files in .sqlite to the simulation software. Should shape files be considered for the coordination with Viasys VDC software?
- Key issues: to define the data exchanges.
- Challenges: decide whether we need all classes for calculation of CAPEX and how to calculate OPEX (operational costs to be considered and how to integrate them in the model). An option could be to use representative cost distributions of existing terminals/logistics providers. The advantage would be to cover all relevant costs categories and keep model and simulations still manageable. Main cost categories (usually roughly 95% of total operational costs) would be staff costs, equipment costs, repair & maintenance, rent & lease costs, administration & insurance, supplies & consumables. Remaining costs could be covered with a position "other operational costs" (e.g. 5% of main costs as described above).

7. WP5 Terminals operational simulations overview

- Corné Versteegt, from MACOMI, explained the status of the deliverables under this work package.
- As agreed during the first meeting in Kiruna, work started with the two real terminals. The connection BIM to SIM (simulation) has been done, and after the Melzo simulation has been completed, we need to see how to connect from SIM to BIM.
- Key issues: how to connect operational and traffic simulations and how to connect the simulation to the Viasys software.
- Challenges: how indicators are shown, possibility to define different dashboards, maybe include some conclusions when indicators are obtained about possible improvements (design what the user can do i.e. modify number of cranes, number of reach stackers, etc.); improve computational time. In addition, the wide variety of case studies mentioned in the other work packages represents also a big challenge.

- At this moment, the simulation is focused on container terminals. Bulk handling has not been considered.
- Corné showed a demo of the simulation for Melzo pilot case.
- MAC, IDP and BED will have a meeting in the upcoming weeks to discuss on what data is still pending for La Spezia pilot case, and it was proposed to make the final check in Melzo and La Spezia to get the approval of the models and results obtained from both terminals.

8. Workshop for integrated multimodal terminal planning

- Challenges when integrating operational simulation and BIM model for terminal planning. Partners directly involved: VTT – MAC – VIASYS – IDP.
- Key issues:
 - o Data (more detail required)
 - o Balance in case studies (how to deal with virtual cases)
 - o Case study participation (Melzo and La Spezia)
 - o Containers vs bulk (multipurpose terminals)
 - o KPIs (definition, calculation and interface with BIM)
 - o Coordination model
 - o Data exchange (BIM)
- Small changes can be done directly in the simulation software.
- The use of Viasys VDC software is friendlier from an end-user point of view.
- Interactive planning (layout, parameters, data exchange)

9. WP6 External mobility effects overview

- The main aim of this presentation was to describe the major objectives and deliverables for this work package, the progress during the first period and the work to be done.
- Francisco Rodero, from CENIT, explained that some progress have been done concerning the definition of input data imported from BIM models. Still some fine-tuning is required.
- Key issues: distribution of trucks entering the terminal between different entrances, and origins – destinations. APSP and CSI will have to decide the scope of the external network to be simulated and should provide if possible, information on distribution of trucks, average flows, peak flows, etc.

10. WP7 Interconnection simulations overview

- The main aim of this presentation was to describe the major objectives and deliverables for this work package, the work done and to be done, and risks and opportunities.
- Again, Corné Versteegt, from Macomi, put a question to the consortium and asked how detailed must be the simulation of the interconnection network. It should be balanced with the level of abstraction of the railway interconnection.
- Getting information of the railway interconnection (traffic, geometric data of the layout, etc.) is really difficult. Should we also take into account the integration with other train services?
- Corné raised the question if we should consider linking the detailed terminal simulation with the network simulation, or consider the network simulation as a separate tool. Finally, we are going for the separate approach with two tools that are loosely coupled.

11. WP8 Functional, economic and environmental analysis

- Pau Morales, from CENIT, described the major objectives and deliverables for this work package, the work done and to be done, and risks and opportunities.
- Joachim Ritzer, from DHL, explained cause and effect and impact on decision support from a logistics company point of view. If less environmental impact is expected, actions on means of transport / energy saving can be taken into account (i.e. modal shift from road to rail) to calculate share of environmental friendly produced transports (“green logistics”).
- In order to know if KPIs selected under WP3 are relevant, a benchmark has been carried out on regularly published KPIs by leading companies in Europe. Conclusions: due to lack of common standards emissions and energy consumption are not really monitored by all stakeholders in the same way and published. But pressure to do so in the future from market and stakeholders side is in the key decision areas (functional effectiveness, financial impact and energy savings/environmental impact), even in terms of giving directions without being accurate in details, would add significant value in decision support.

SECOND DAY, 21/09/2017

12. Workshop 1: Planning in integrated multimodal terminals

1) Planning in Integrated multimodal terminals

- **Planning/BIM**

- Data (more, details)
- **Data exchange in BIM and generation of coordination model**
- **KPI definition and calculation** (interfaces to BIM, Operational simulation)

- **Planning/BIM Data** (more, details)

- How to combine BIM model in a way that e.g. libraries can be utilized efficiently.
- Data for filling BIM model, where to get and how to present information from terminal activities, CAPEX, OPEX etc.
 - Discuss with Corne (Macomi), they have collected part of information into a separate model. Conclusion, we stay in high level.
 - More information expected from Melzo and La Spezia, if we want to have an accurate model from terminal. Bedeschi will provide more information about equipment in La Spezia.
 - **Meeting IDP – BED – APSP – CSI – MAC** to discuss information on maintenance and performance rates of the equipment.
- Calculating CAPEX and OPEX, really relevant for the assessment of the project (top of financial). Knowing the most expensive items – try to relate to the goal (i.e. 5% cost reduction).
- For operational costs, 2 parameters must be considered (how the terminal is handled, reach stackers or automated veh.; where the terminal is located, low-level or high-level country) – Macomi will provide some information.

- **Data exchange in BIM and generation of coordination model**

- Are open formats enough, and what formats we use to support data exchange.
- Example – Generation of initial layout. First in GIS format (SQLite), then design model (BIM formats). GIS and BIM have crucial differences.
 - **Brainstorming needed** - Use Autocad3D and export to GML, customize the set to include necessary attributes (Property set). Then take model into Viasys VDC and develop 3D. (**Viasys, IDP, VTT**)

- **KPI definition and calculation** (interfaces to BIM, Operational simulation)

- Data for indicator comes from Simulation, BIM and part is estimated. Specification is needed for solving do we try to include indicators into Viasys VDC or other platform. Some of the indicators are tied to location, and there is additional value to presence it location-based.
- Timeline for indicators: Terminal of the future means life-cycle consideration, but it makes challenges for calculation.
- Life-cycle for terminal is 40-years, and simulations are usually made for peak shifts or long term of a year.

- **Brainstorming to find a balance with operational simulation and life-cycle (DHL, Macomi, IDP, VTT)**

13. Workshop 2: Simulation in integrated multimodal terminals

2) Simulation in Integrated multimodal terminals

- **Interactive planning** (tool that generates layout, 3D and parameters, data exchange)
- Operational simulation and external mobility simulation discussion – discussion by MAC and CENIT
- **End-user view point to integrated planning** (2D vs. 3D, show results)
- Interface design?

- **Interactive planning** (tool that generates layout, 3D and parameters, data exchange)
 - Product is under development, and there is possibility to try. Depending on the modelling work, this might be demonstrated as technology later, and included into deliverable, but not fully demonstrated in project.
 - **Deliverable section (Viasys, VTT, IDP)**
- Operational simulation and external mobility simulation discussion
 - **Discussion by Macomi and CENIT**
- **End-user view point** to integrated planning (2D vs. 3D, show results)
 - Aim is to demonstrate the concept of integration.
 - There is two levels, general set up where things might be interactive, and then there is detailed process development where logistical solution is streamlined.
 - If client has number of terminals in many locations, then there is need to optimize.
 - **Expectation to see current situation and possibly some small changes in Melzo and La Spezia**

14. Workshop 3: Case studies and scenarios

- Participation of Melzo and La Spezia
- **Data and information** for the good definition
- **Balance in case studies**
 - current terminal situation
 - improved terminal situation
 - virtual terminals
- **Container terminal vs. bulk terminal** and cold (PO comment)

- **Participation of Melzo and La Spezia**
 - **Contact people to be distributed later for everyone (IDP, CSI, La Spezia)**
 - **La Spezia and Melzo – be prepared for review meeting of simulation**

- Data and information for the good definition
 - **IDP needs to talk CSI and La Spezia. BED will provide some information about equipment in La Spezia.**

- **Balance in case studies**
 - Current terminal situation (ok, in progress) , improved terminal situation , virtual terminals
 - **Container terminal vs. bulk terminal (PO comment)**
 - **Life-cycle**
 - **Macomi reviews WP3 pilot innovations and improvements (try to find a meaningful way to simulate)**
 - **Macomi and IDP discuss and agree simulations to be done in project (meeting next week)**

15. WP9 Exploitation, dissemination and communication

- Donata Strycharczyk, from ZNIK, describes what has been done under the tasks of dissemination and communication.

- More activity is required through the website and social networks. ZNIK should try to update news and follow newsletters and websites from all partners and post interesting things that are related to the Intermodel project. Importance of updating the news section in the website.

- Pau Morales, from CENIT, showed a list of possible conferences and journals where the partnership could publish articles and papers.

- Gisela Soley, from IDP, explained next steps to complete version 1 of the Exploitation Agreement to be submitted in February 2018. First draft was distributed among partners in early September considering answers and opinions obtained from the questionnaire worked during the first global meeting.

THIRD DAY, 22/09/2017

16. Close up and upcoming work

- Gisela Soley proposed to hold next global meeting in Barcelona around March 2018.

- The project coordinator briefed all the agreements reached during the project meeting as described in the following subsection 'main decision / relevant issues raised' and listed all deliverables due

- The Project Coordinator closed the meeting after thanking all the partners for their participation and VTT for the event organization.

MAIN DECISIONS / RELEVANT ISSUES RAISED

All the relevant information is included in the annexed presentations, as follows:

Presentation.pdf	WP5_WP7_Espoo_MAC.pdf
Project Overview.pdf	WP6_Espoo_CENIT.pdf
WP1_Management.pdf	WP8_Espoo_CENIT-DHL.pdf
WP2_Espoo_VTT.pdf	WP9_Communication_Espoo_ZNIK.pdf
WP3_Espoo_FGC.pdf	WP9_Exploitation_IDP.pdf
WP4_Espoo_IDP.pdf	Close up_Espoo_IDP.pdf

Decisions or relevant issues raised during presentations:

- Loop for each work package and on-line meeting once a month to keep all partners informed about the progress in each work package.
- Deadlines to prepare the amendment by the end of November.
- Important to define who the final user is. According to this, you will design high-level and more detail planning.
- Interface design according to KPIs list.
- Brainstorming needed - Use Autocad3D and export to GML, customize the set to include necessary attributes (Property set). Then take model into Viasys VDC and develop 3D. (Viasys, IDP, VTT).
- Data for indicator comes from Simulation, BIM and part is estimated. Specification is needed for solving do we try to include indicators into Viasys VDC or other platform. Some of the indicators are tied to location, and there is additional value to presence it location-based.
- Discuss how to integrate container and bulk within a terminal. Does it really make sense? Bear in mind that bulk terminals are dedicated terminals whose handling, equipment, etc. will be defined according to the type of material handled (coal, wood, salt, etc.).
- MAC, FGC and IDP will review pilot innovations and improvements and find a meaningful way to simulate them. Need for an agreement on which simulations must be done under the project. Meeting during next week.

Upcoming meetings

- ✓ IDP – MAC (make a decision concerning innovations and case studies to be simulated and container vs bulk) – next week
- ✓ IDP – MAC - APSP – CSI – BED (data and information expected and later validation of the simulations)
- ✓ CENIT – IDP – CSI – APSP (scope of the external network and data)
- ✓ VTT – VIASYS – IDP (brainstorming on coordination model and data exchange)
- ✓ VTT - MAC – DHL - IDP (balance with simulation and life-cycle)
- ✓ IDP – APSP (CMP information and integration) – 28/29 Sept.
- ✓ IDP – VIAS – BASF (maintenance and LCA)