PROGRESS UPDATE WP 5
(TERMINAL OPERATIONAL SIMULATIONS)

PROGRESS UPDATE WP 7
(NETWORK SIMULATIONS)

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European Commission

MACOMI Systems Simulation

HORIZON 2020

PROGRESS UPDATE WP 5

Terminal Operational Simulations

Build a *simulation-based decision support environment* to support

1. Optimizing the design of the intermodal terminals
   - Layout
     - get the layout/design right before construction and operations: changes are costly (time and money) or….even not possible.
     - holistic integrated approach (civil / equipment / IT / operations / financial / HSSE / hinterland)
   - Numbers of equipment (che)
   - Operational performance
   - Phasing of terminal and equipment
2. Improve the operational performance of intermodal terminals

2- OBJECTIVES AND DELIVERABLES

Deliverable	M	Risks / Important to notice
D5.1 - Data model • What is scope? • What data required?	6	DONE Visit La Spezia / Melzo for validation

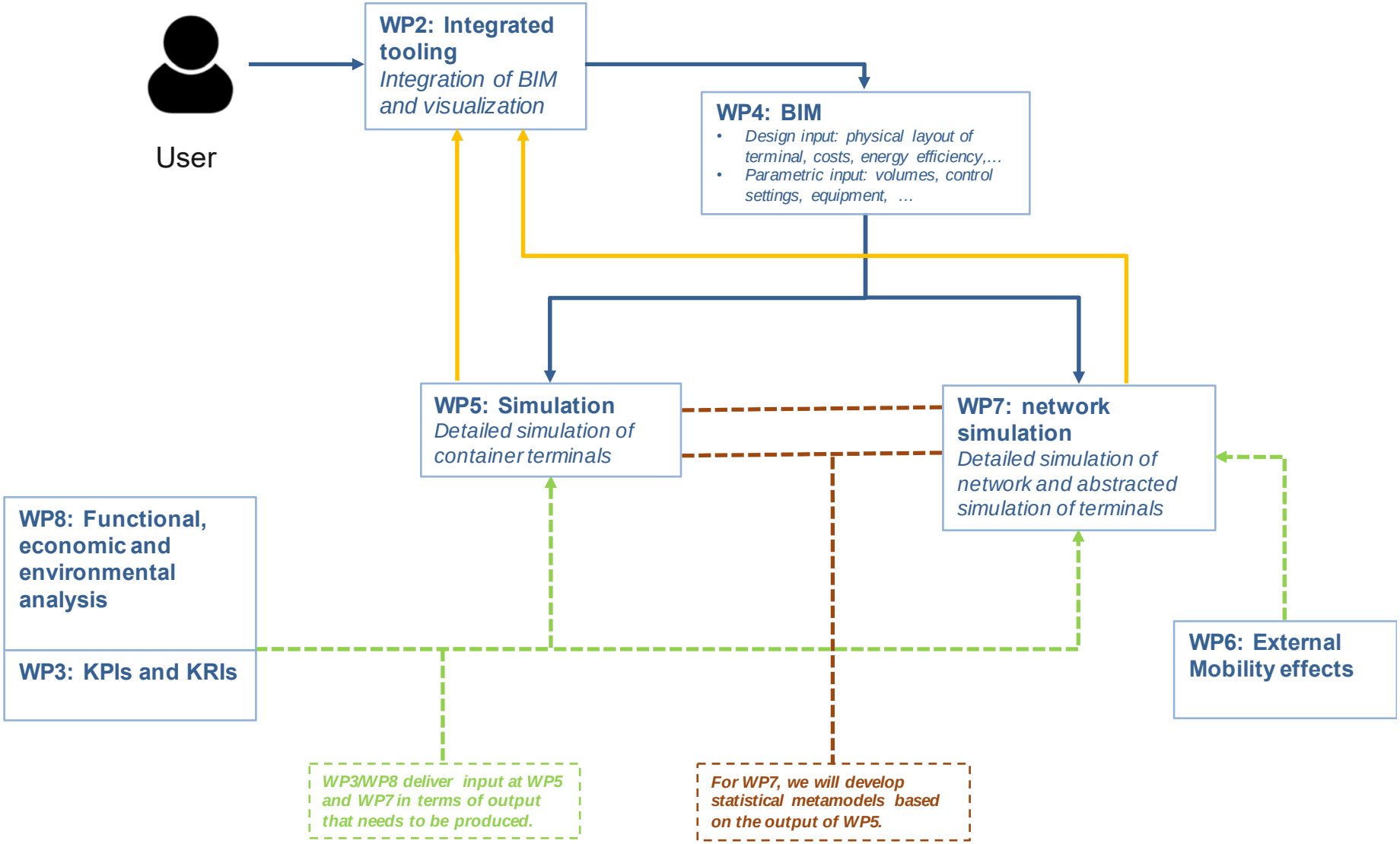
2- OBJECTIVES AND DELIVERABLES

Deliverable	M	Risks / Important to notice
D5.2 - Ontology and conceptual model • A view under the hood	9	Draft ready for review Visit La Spezia / Melzo for validation
D5.3 First case study	17	Start made with development of library of simulation components
D5.4 Second case study	17	

3- WORK DONE

- Deliverable 5.1 finished
  - Data model
  - Data requirements
- Deliverable 5.2 draft finished
  - Please review!
- Meeting La Spezia / Melzo
  - Scope and validation case study 1 / 2
  - Data requirements
  - Overall architecture

ARCHITECTURE (DRAFT)



OVERALL ARCHITECTURE (WP2/4/5)

Input

Simulation

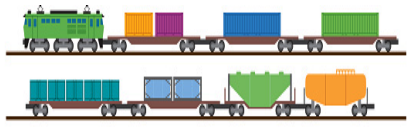
Output

User

Volume and logistics

Control

Rolling stock / equipment



Infrastructure

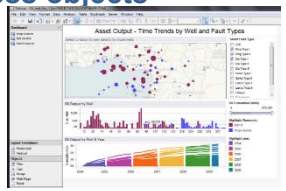
DATABASE
Experimental setting
Simulation results

Simulation model

KPI
- Animation
- Heat map
- Graphs

Dashboard

B.I. tools
- Tableau
- Business objects



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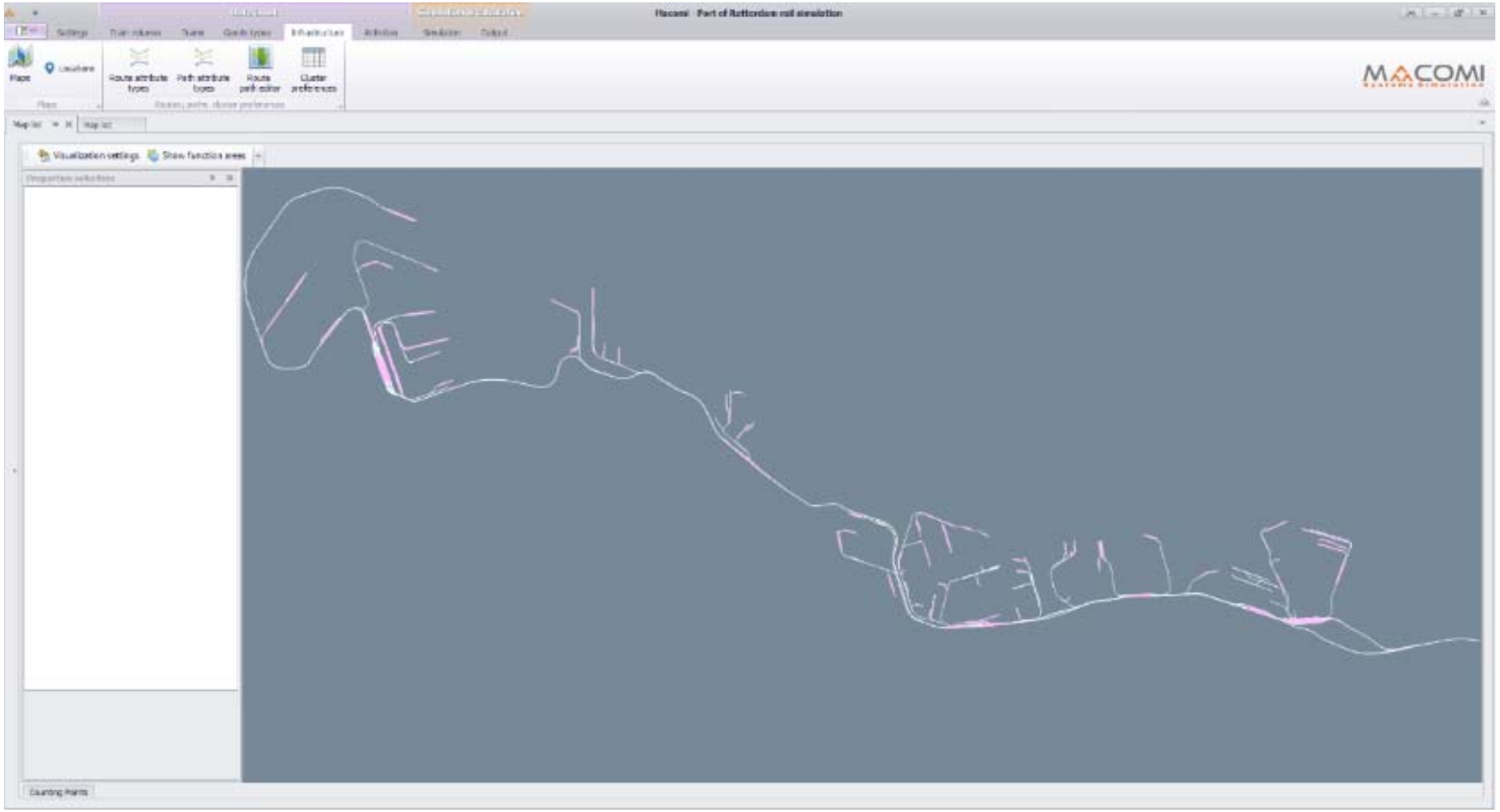
Four steps in architecture / simulation

1. **Infrastructure**
   - Get the layout of terminal from BIM into simulation
2. **Scenario/simulation settings**
   - Scenario for volume, control and equipment
3. **Run/experimentation**
   - Run/experimentation settings
   - Simulation experiments
   - Results/KPI from simulation to BIM
4. **Output visualisation**
   - Results/KPIs from simulation to BIM

TEST BIM -> SIMULATION



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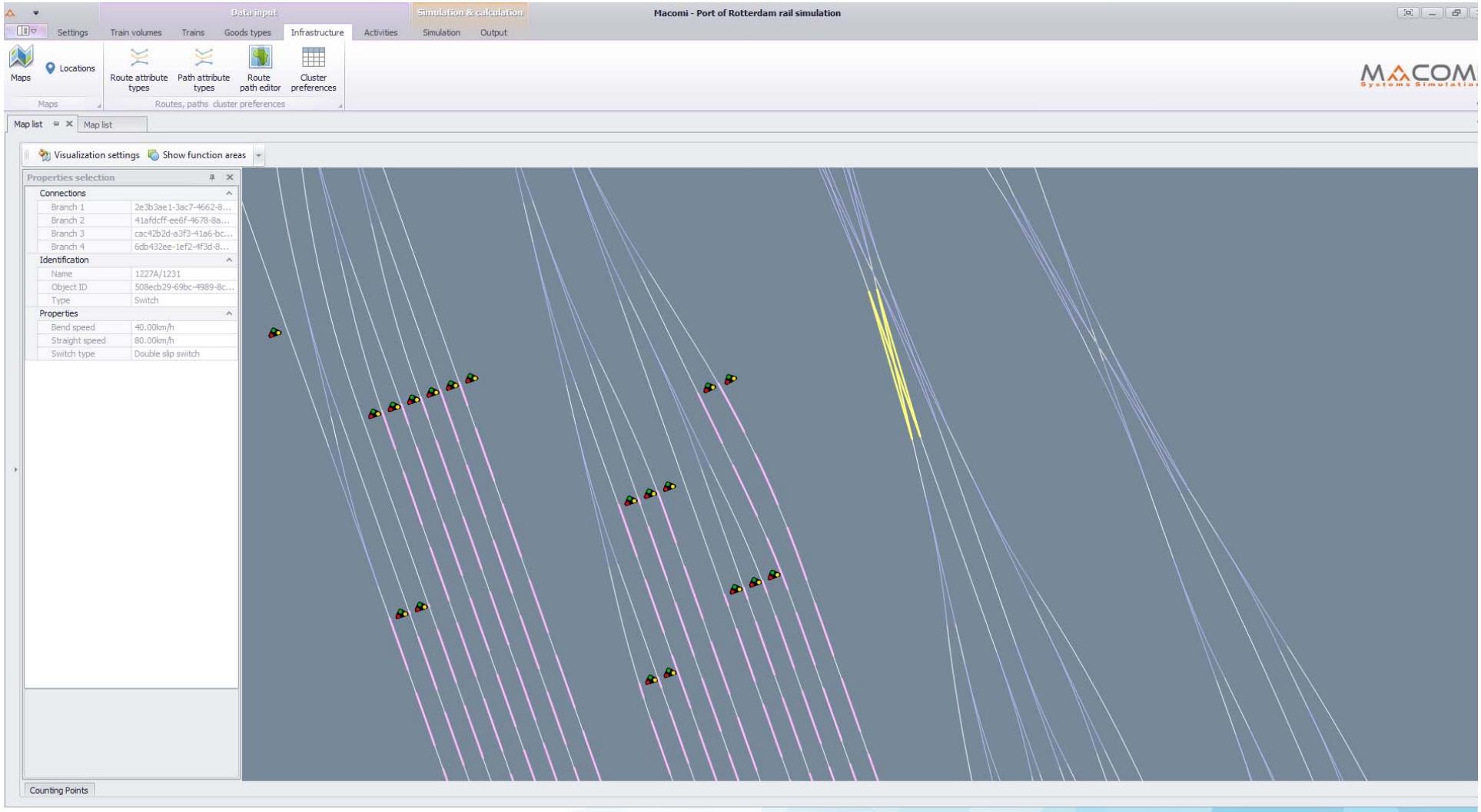
TEST BIM -> SIMULATION



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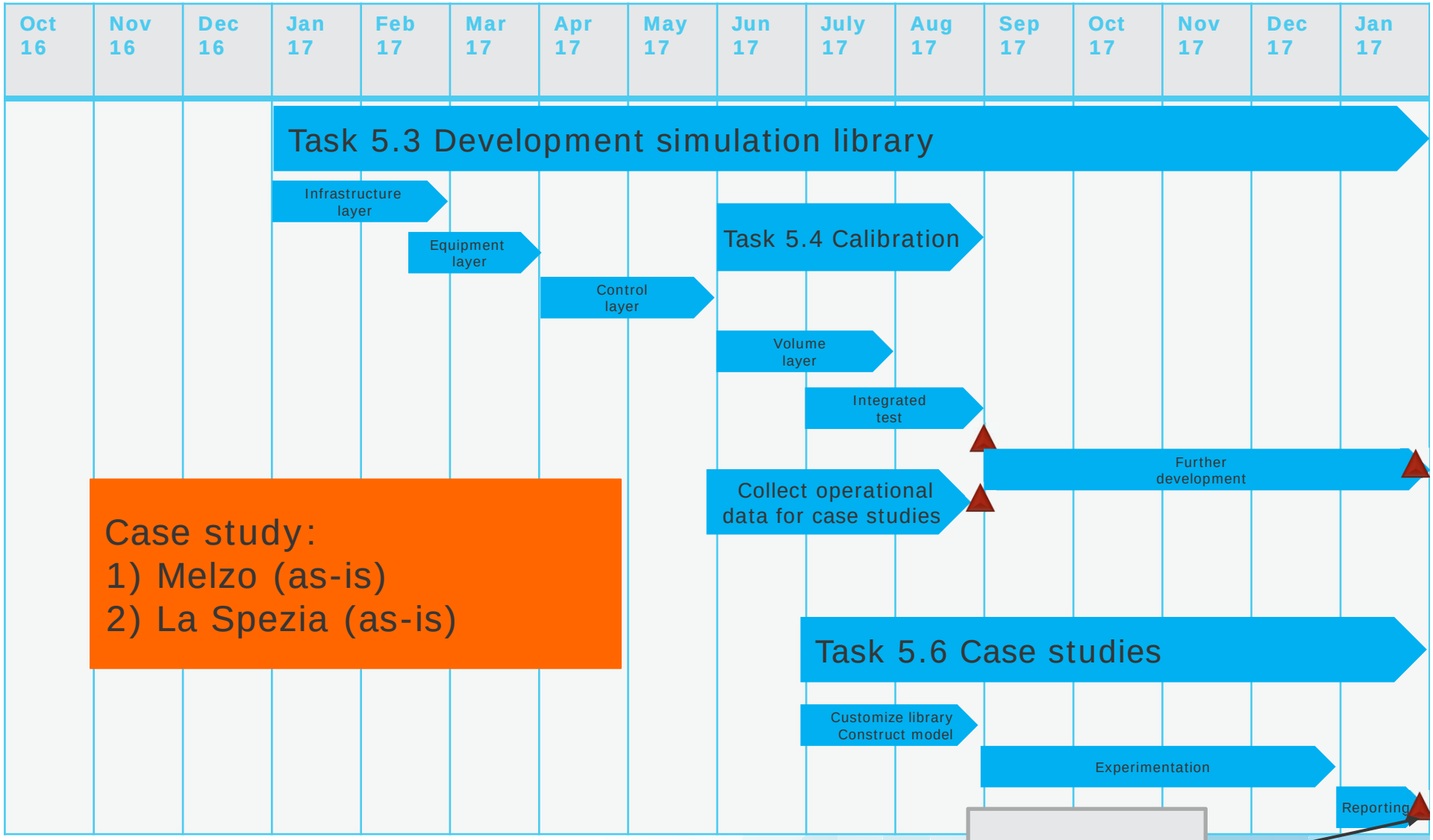
4 - IMMEDIATE OBJECTIVES (NEXT 6 MONTHS)



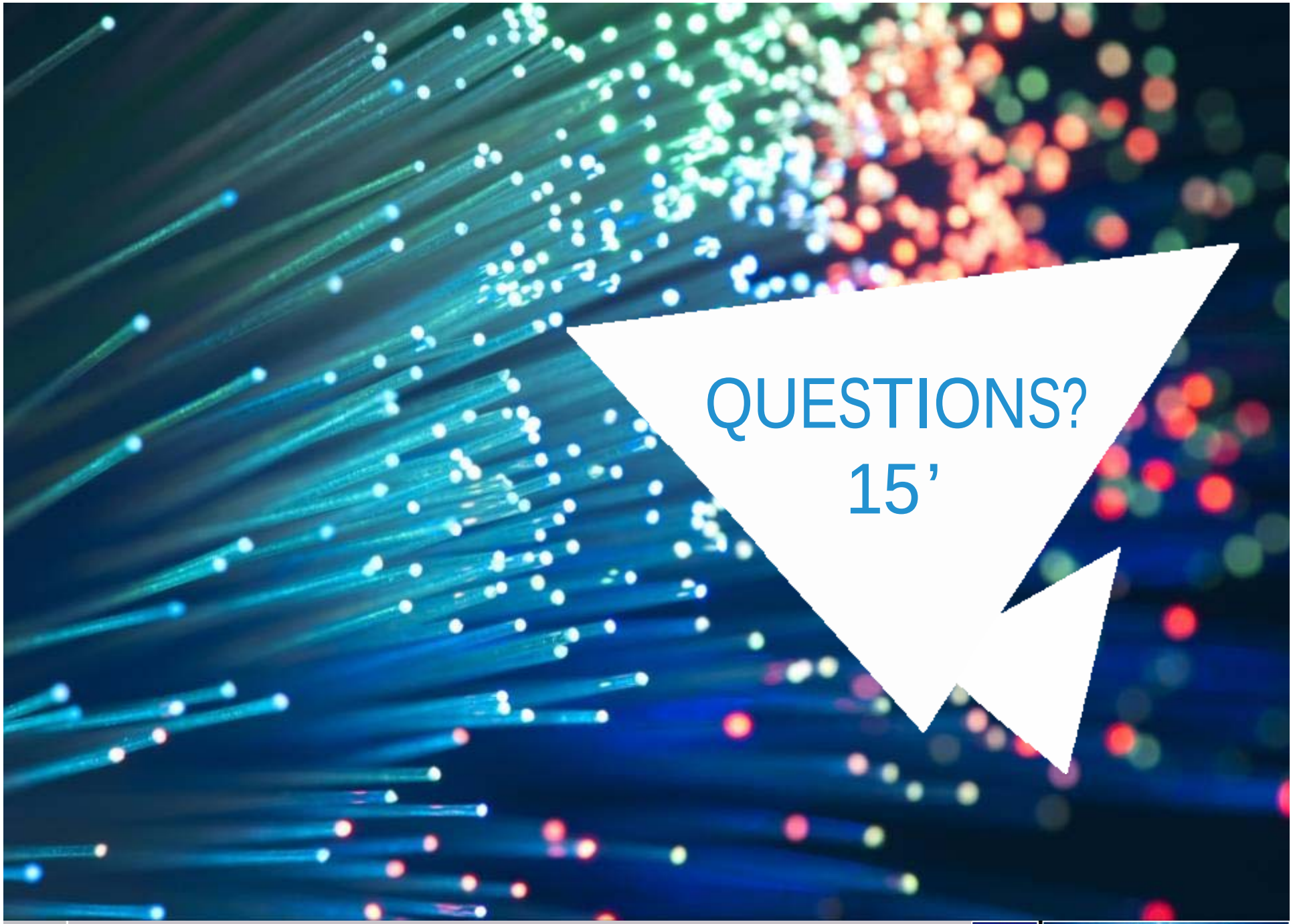
4 - IMMEDIATE OBJECTIVES (NEXT 6 MONTHS)

Partner	Main role / tasks / work to carry out

CSI
+
La Spezia
	• Facilitate access to terminals, personal and data
	• Provide data for case studies
	  • Terminal designs / specifications / equipment
	  • Process flows
	  • Operational performance data

IDP VTT VIASYS	WP2/4/5 • Key challenge: integrated overall architecture and interface • Meeting in Melzo was good start, follow required!
CENIT	WP3 Questions / challenges • Operational definition of KPI? • We can not calculate all KPIs directly from the simulation….additional calculations required • Do we have the operational data to calculate/validate them?

- The focus of the case studies is container terminals….
  - Melzo / La Spezia
  - What about other types of terminals?
- Integrated architecture
  - Planning / BIM / simulation



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PROGRESS UPDATE WP 7

Network Simulations

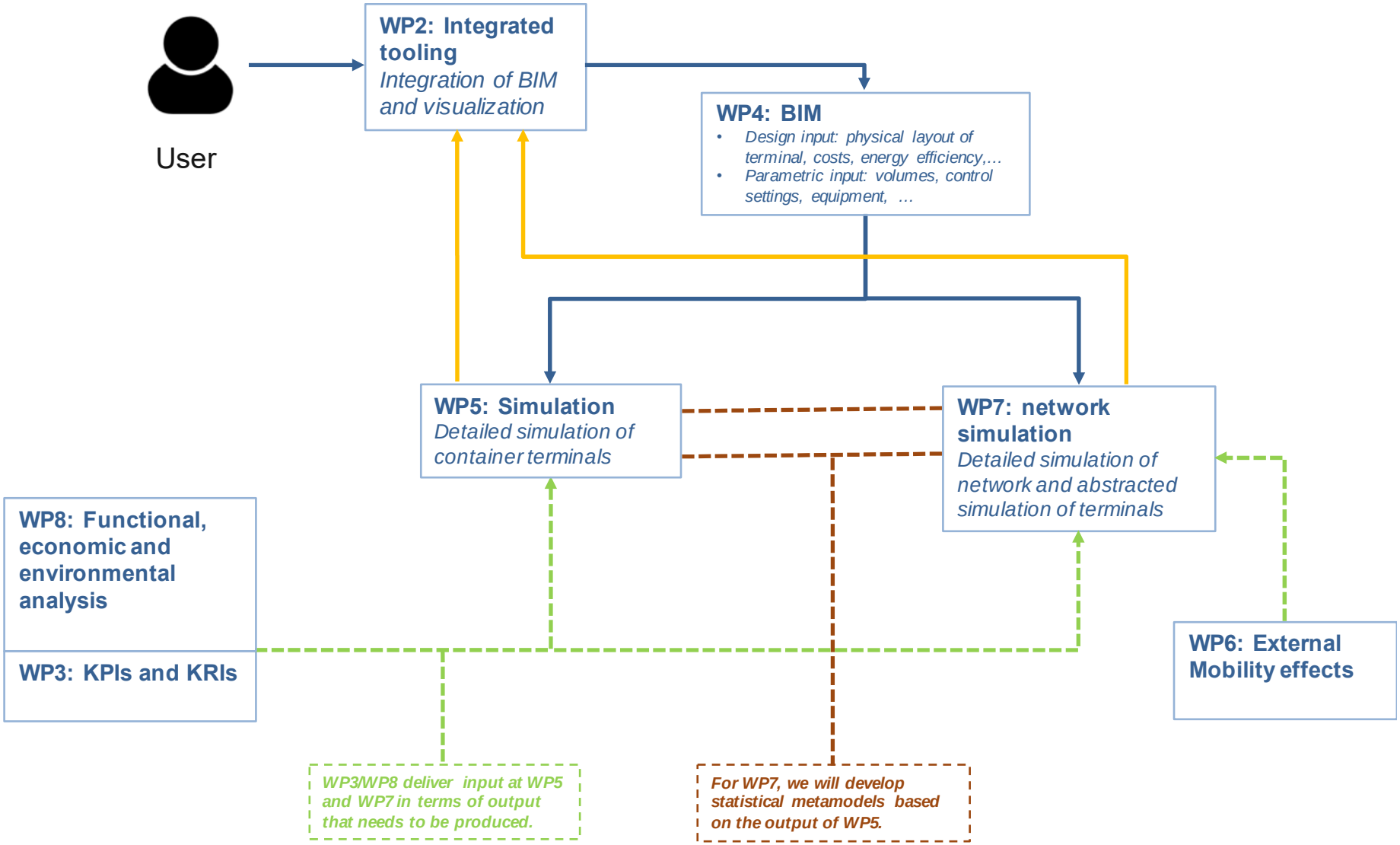
Create a simulation based assessment tool to

- Asses the interconnectivity between terminals
- Align the design of terminals and network

Major activities

- Build simulation assessment tool
- Pilot test case
- Study the resilience of the interconnectivity

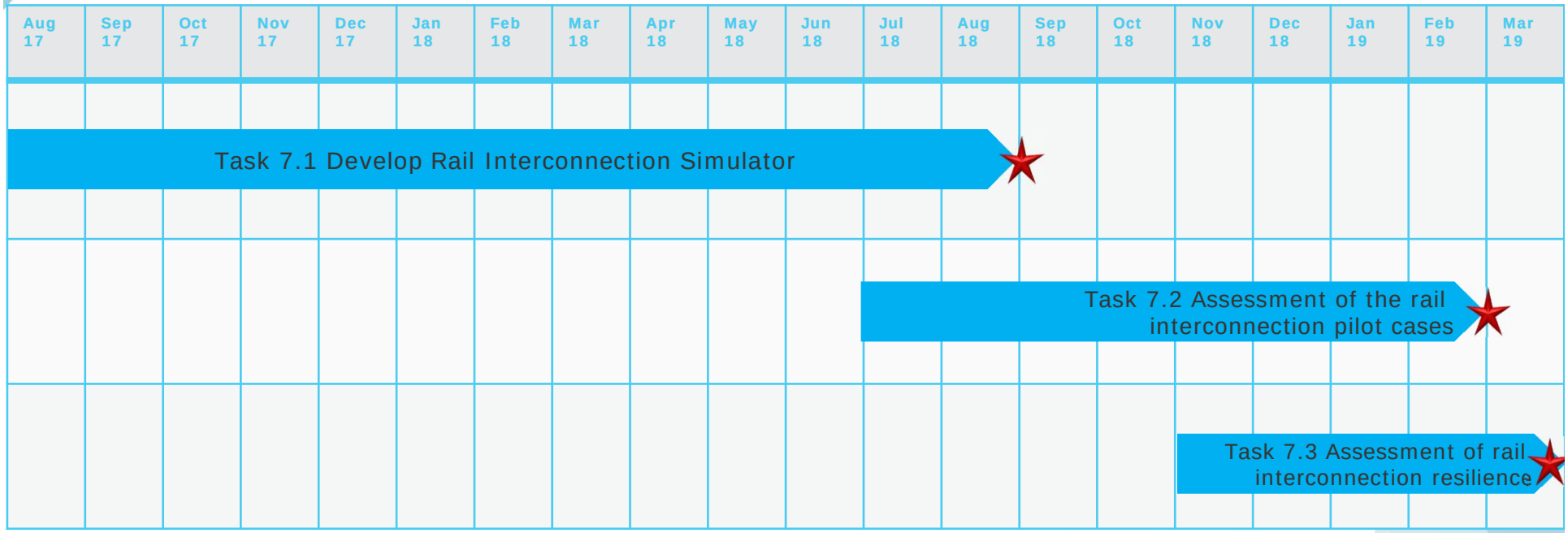
ARCHITECTURE (DRAFT)



DELIVERABLES AND MILESTONES LIST

Deliverable	Month	Risks / Important to notice
D7.1 Rail interconnection simulator	24	The interaction between terminal simulation and network simulation (WP5/WP7) • Which level of detail of abstraction
D7.2 Assessment in pilot cases	30	Selection of pilot study • Corridor La Spezia and Melzo terminal • Data on network?
D7.3 Assessment of the interconnection resilience	32	Definition of resilience and recovery Collection of operational data required

DETAILED PROJECT TIMELINES, DELIVERABLES & MILESTONES



Legend:

Dependency

Deliverables

4 - IMMEDIATE OBJECTIVES (NEXT 6 MONTHS)

Partner	Main role / tasks / work to carry out
CSI + La Spezia	• Facilitate access to terminals, personal and data • Provide data for case studies on train services between La Spezia and Melzo
IDP VTT VIASYS	WP2/4/5 • How does the network fit into the overall architecture? • What can we get from the BIM? Layout??

CENIT	WP3 Questions / challenges
	• Network KPIs
	  • Resilience?
	  • Reliability?

- Test model for netwerk simulations
  - Start with
    - Rotterdam (terminals and shunting yard)
    - Duisberg (intermodal terminal)
- Bundeling of cargo

- Level of abstraction
  - Link WP5/7…..mixing detailed terminal simulation and network simulations
  - Or separate tool?
- Data/layout on network
  - Where do we get this information?
  - Integration with other train services?

THANKS!

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