



Route optimization and synchromodal planning for resilient supply chains



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Route Calculation and Sychromodality

Support adaptive and resilient logistics planning through dynamic route optimisation. Provided by **Computational Engine for Resilient Logistics (CERL)**

Main functionalities

- Generation of alternative transport routes
- Dynamic transport planning
- Sychromodal transport coordination
- Re-routing support
- Integration Computational Engine - ModalNET

Benefits

- Increased resilience
- Reduced delays
- Improved operational flexibility
- Better use of transport resources

Route Calculation and Sychromodality

Computational Engine for Resilient Logistics (CERL) – Adaptive & Resilient Route Planning

□ User Groups

- **Logistics Services Supply Group** (Transport Service providers) – includes shipping lines, vessel and rail operators, and truck operators who provide transport assets and input route-related data.
- **Logistics Services Demand Group** (End Users) – consists of cargo owners, LSPs and freight forwarders who submit detailed transport requests based on their logistics needs.

□ CERL can be used as a standalone tool, but is **integrated within ModalNET** through APIs, allowing data exchange with other logistics systems.

APIs - Preferred method:

- ✓ Handling of big scale interactions
- ✓ Long term planning
- ✓ Automation
- ✓ back-office systems dynamic interaction

UI - Better for:

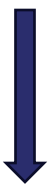
- ✓ Smaller players
- ✓ Ad-hoc changes/requests



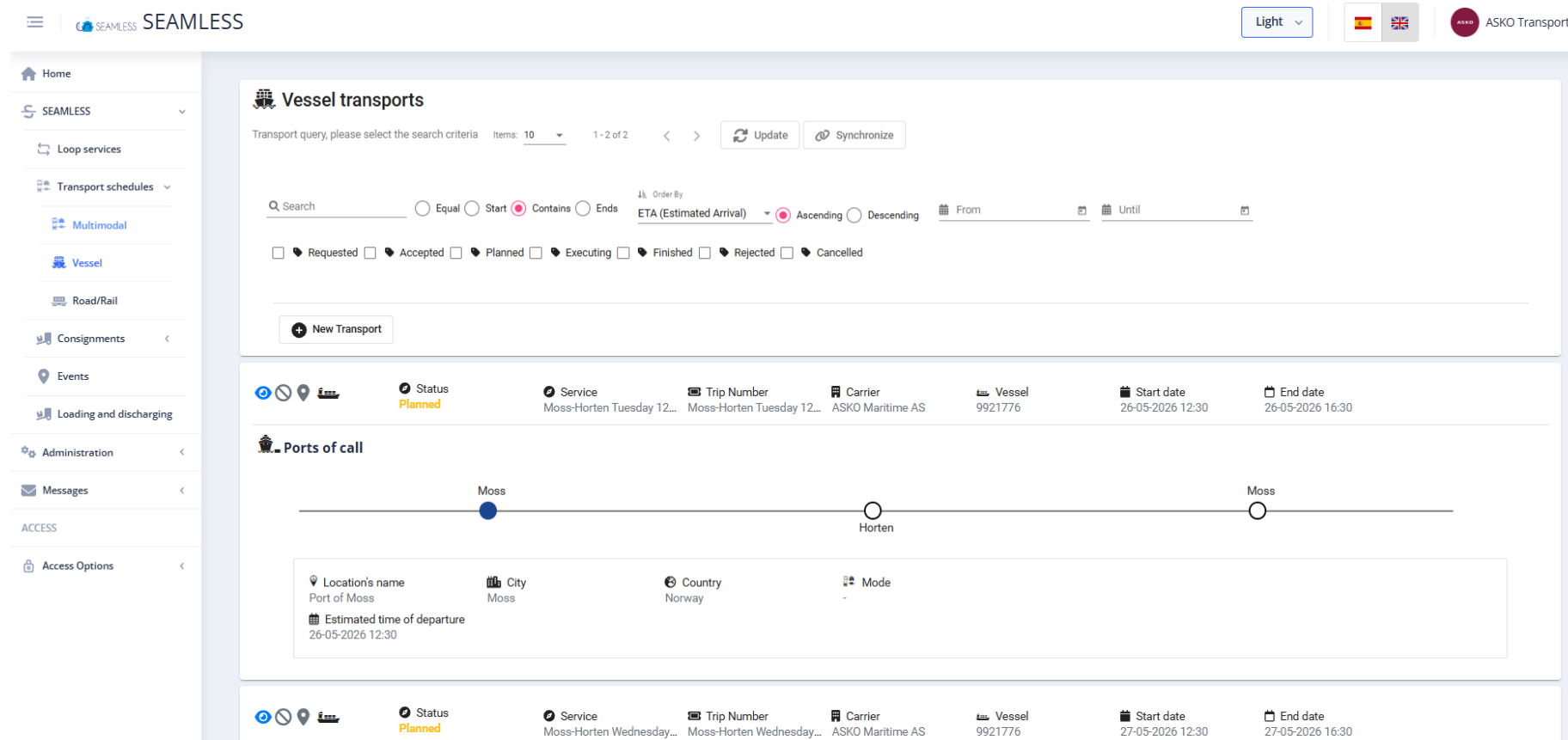
Route Calculation and Synchromodality

Logistics Services Supply Group

- Transport schedules
- Capacity & availability
- Continuous updates



Using this info **CERL** creates a **graph-based representation** of the transport network



Vessel transports

Transport query, please select the search criteria Items: 10 1 - 2 of 2 < > [Update] [Synchronize]

Search [] Equal [] Start [x] Contains [] Ends [] Order By ETA (Estimated Arrival) [x] Ascending [] Descending From [] Until []

☐ Requested ☐ Accepted ☐ Planned ☐ Executing ☐ Finished ☐ Rejected ☐ Cancelled

[+ New Transport]

Status	Service	Trip Number	Carrier	Vessel	Start date	End date
Planned	Moss-Horten Tuesday 12...	Moss-Horten Tuesday 12...	ASKO Maritime AS	9921776	26-05-2026 12:30	26-05-2026 16:30

Ports of call

Moss ———— Horten ———— Moss

Location's name: Port of Moss City: Moss Country: Norway Mode: -

Estimated time of departure: 26-05-2026 12:30

Status	Service	Trip Number	Carrier	Vessel	Start date	End date
Planned	Moss-Horten Wednesday...	Moss-Horten Wednesday...	ASKO Maritime AS	9921776	27-05-2026 12:30	27-05-2026 16:30



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Route Calculation

Logistics Services Demand Group

- Transport request/consignment details
- Origin
- Destination
- Time windows
- Cargo type
- Quantity



CERL calculates feasible routes, using topology algorithms that evaluate possible paths in the network **based on request criteria**

Consignment edition

General data

Consignment hierarchy

Goods

</> JSON View

Consignment Ref. *

202699901

B/L

Requestor reference

Mode *

Multimodal

Requested pickup date

12/3/2026

Requested delivery date

18/3/2026

Parties

Consignor *

ASKO Transport AS

CIF

NO999320600

Consignee *

ASKO Oslofjord AS

CIF

NO930622974

Carrier *

ASKO Maritime AS

CIF

NO925216534

Route

By default, if not origin is specified, the origin identifier shall be the identifier of the sender (consignor). In the same way, if not destination is specified, the destination identifier shall be the identifier of the recipient (consignee).

Origin

Place

ASKO Transport AS

CP

1540

City

Vestby

Province

Country

Norway

Address

Deliveien 33

Destination

Place

ASKO Oslofjord AS

CP

3070

City

Sande i Vestfold

Province

Country

Norway

Address

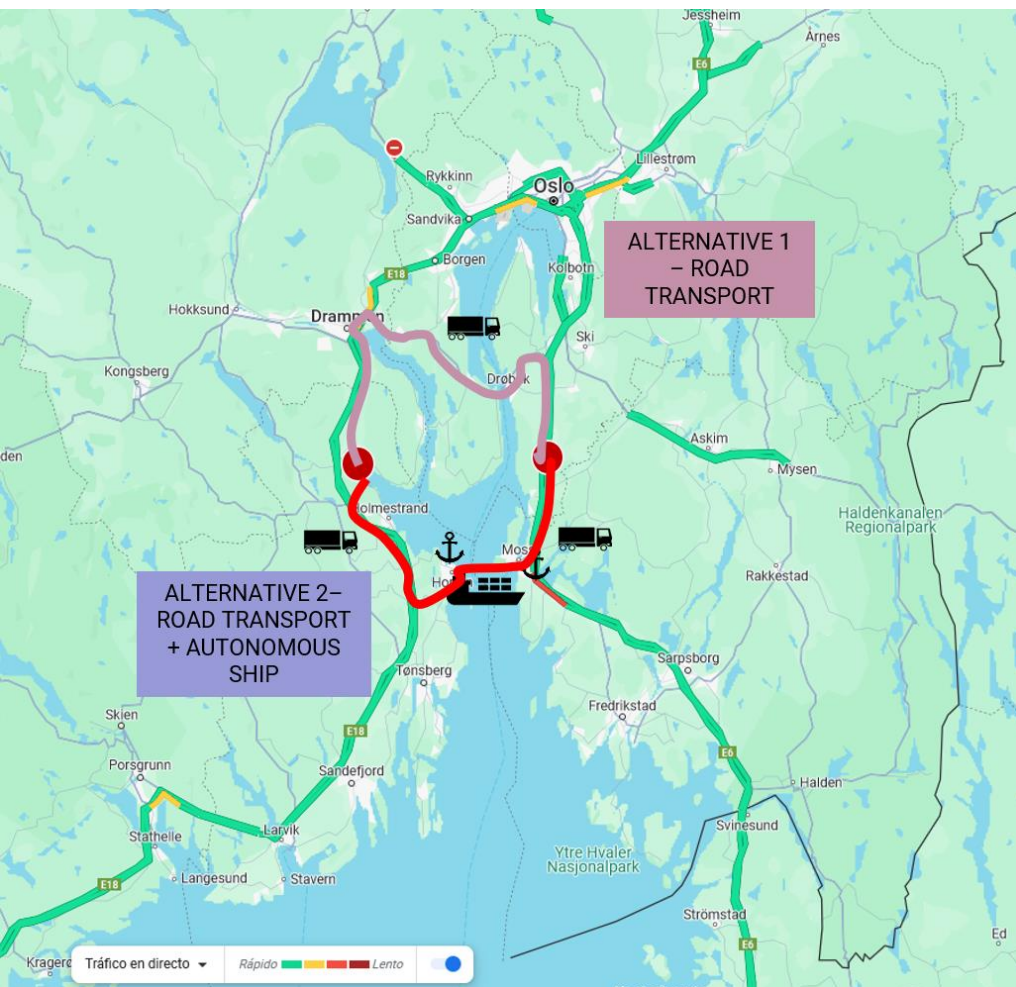
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Route Calculation and Synchromodality



CERL

- Creates a graph-based representation of the transport network
- Calculates feasible routes, using graph topology algorithms
- **Returns** available (multimodal) route options satisfying the request
- Allows **users to review and select** the most suitable transport plan

Associated transport

Search across all fields

Source	Transport mode	Origin	Start date	Destination	End date	route	Carrier	Actions
CERL	Road	Vestby	25-05-2026 00:00	Sande i Vestfold	25-05-2026 02:00	Vestby, Sande i Vestfold		✓
CERL	Multimodal	Vestby	26-05-2026 11:00	Sande i Vestfold	26-05-2026 14:30	Vestby, Moss, Horten, Sande i Vestfold	ASKO Maritime AS	✓
CERL	Multimodal	Vestby	27-05-2026 11:00	Sande i Vestfold	27-05-2026 14:30	Vestby, Moss, Horten, Sande i Vestfold	ASKO Maritime AS	✓

Items: 10 1 - 3 of 3



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