MARITIME TRANSPORT

Astra-Terra specialises in the application of advanced technology, simulation, mathematical modelling and optimisation to improve the efficiency of the services in the maritime sector. We deliver this through extensive and demonstrable expertise in port planning, operations and management; shipping operations; port-to-port operations; maritime, inland and third party logistics; network reliability and disaster recovery; and developing and transition economies. Our advanced in-house models and tools allow us to deliver significant improvements speedily and cost-effectively.

**Port operations and management**

Our expertise in port operations includes the specification and measurement of key performance indicators (KPIs), determination of best practice through operational and strategic benchmarking, tactical and strategic logistics modelling, functional and process modelling, simulation of traffic infrastructure within and in the proximity of ports, and port economics. In management, we have expertise in port development scenario planning, strategic port pricing, port marketing and competitive models, demand modelling or traffic forecasting, policy formulation, port sustainability and waterfront management.

**Shipping operations**

Astra-Terra’s expertise in shipping operations includes the development and application of novel mathematical models for port choice, design of liner shipping service networks, shipping line yield management, and optimal carrier and shipper routing and scheduling.

**Port-to-port operations**

Our expertise in advanced positioning, navigation and timing (PNT) technologies, geospatial science and engineering combined with novel communication and surveillance systems enable an integrated approach to the management of ships. This accrues many benefits both at strategic and tactical levels including environmentally-friendly route determination and navigation, and fleet tracking. Our expertise in air quality measurement and modelling underpin our ability to not only verify the choice of routes but also assess the impact of emissions on the surrounding environment.

**Port technology and planning**

Astra-Terra’s established expertise in planning and port technologies facilitate efficient and integrated port designs that account for advanced operational requirements and address common performance bottlenecks. The requirements include increasing levels of automation (e.g. automated guided vehicle (AGV) and automated stack crane (ASC) operations). Astra-Terra’s expertise in CNS (communication, navigation and surveillance) and geospatial technologies, together with simulation, modelling and optimisation are key enablers for efficient planning and design.

**Maritime, inland and reverse logistics**

Our work in logistics addresses the many relevant complex issues to deliver the required KPIs including accuracy and reliability. We cover the issues of repositioning empty containers, landside port logistics, intermodal operations and management, logistics patterns and network routing, depot location, interregional input-output models, economic impact analysis, and supply chain modelling.

**Network reliability and disaster recovery**

Astra-Terra recognises the mission (e.g. safety and commercial) criticality of maritime transport. Our consultants have the expertise to specify cost-effective ways of protecting maritime services including architectures for port security systems employing relevant technologies (e.g. CNS and RFID), modelling of the reliability and robustness of shipping networks, quantification of the vulnerability of supply chains, statistical risk analysis, safety regulation, risk management, and the economics of safety and security.

**Ports in developing and transitional economies**

Astra-Terra’s consultants understand the unique environments in which maritime services are provided in developing and transitional economies. We also understand the challenges associated with transferability of systems and practices from the developed world. Therefore, we provide tailor made solutions to these economies in the areas of institutional restructuring, privatisation and ownership models, adaptive operating systems, investment and funding of transport infrastructure, regulatory reform and policy.