Service Network Design of Liner Shipping

Shahin Gelareh*†1,2, Frederic Semet*‡3, and Monemi Neamatian Monemi*§4

1Shahin Gelareh – Université d’Artois : EALGI2A – Faculté des Sciences Appliquées - LGI2A
Technoparc - Zone Futura - 62400 Béthune, France
2LGI2A – Université d’Artois : EALGI2A – UArtois, LGI2A (EA 3926), F-62400, Béthune, France,
France
3Ecole central de Lille – Ecole Centrale de Lille – EC-Lille LAGIS, F-59650, Villeneuve d’Ascq, France,
France
4ISIMA – Université Blaise Pascal - Clermont-Ferrand II – Université Blaise Pascal, CNRS, LIMOS,
Complexe scientifique des Cézeaux, 63173 Aubière cedex, France

Résumé

All shipping liner companies divide their service regions into several rotations (strings) in
order to operate their container vessels. A string is the ordered set of ports at which a
container vessel will call. Each port is usually called at no more than twice along one string,
although a single port may be called at several times on different strings. Moreover, hub-
and-spoke operations is also the core of the operation and a major part of the trade volume
is transhipped at least once along the origin-destination path. We present a mixed integer
programming model which determines the location of transhipment ports and designs re-
gional routes for the feeder services.

As for even small instance size the problem becomes intractable, we will also present a
decomposition scheme developed for solving instances of problem.

Mots-Clés: Liner shipping, integer programming, decomposition, routing, location

*Intervenant
†Auteur correspondant: shahin.gelareh@univ-artois.fr
‡Auteur correspondant: frederic.semet@ec-lille.fr
§Auteur correspondant: monemi@isima.fr