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Key Factors in the Development of Short Sea Shipping in Canada and Australia

Agenda

- Review of Canadian research on market needs and requirements for short sea adoption
- Review of Australian research on market needs and requirements for short sea adoption
- General conclusions drawn on why it works (does not work)

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Research on Making Short Sea Work Better (1)

- MariNova Consulting (2005), in a study for the Transportation Development Centre of Transport Canada, investigated the business case for a Halifax—Hamilton service. They found:
  - It is difficult to compete directly with rail on the corridor given existing domestic rail rates
  - The Seaway is seasonal and shippers want year round service (switching to rail winter only not an option)
  - A 25% duty on vessels imported discourages fleet renewal (In 2008, this became a flash point for Canadian shipowners and was removed for large vessels in 2010.)
  - Inability to gain pilotage exemptions for Canadian vessels in the St. Lawrence adds to the cost
  - There might be a business case in a non-rail corridor

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Research on Making Short Sea Work Better (2)

- Brooks, Hodgson and Frost (2006) undertook a comprehensive pre-business case for Transport Canada to examine Integrated SSS on the Atlantic Canada/I-95 corridor:
  - Provided the preliminary indications of shipper willingness to use ISSS and some demand characteristics
  - Data on service characteristics that a service would offer
  - Identified policy impediments
- Follow-up Question: Why have 6 services failed in the last 25 years on the Halifax—New England route given:
  - can use cheaper international ships,
  - and the land distance is more than the sea distance by double?
    Answer: It isn't about only economics…

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Some Relevant Findings for Cargo Owners (Brooks, Hodgson & Frost, 2006)

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Documentation, Flexibility & Pricing

- More than twice as many companies preferred a single carriage document than multiple contracts. Conclusion: a single contract arrangement has a greater chance of succeeding, all else equal.
- This encourages us to identify the interest of trucking companies and potential short sea operators in a retailing of an integrated transport package over one that is not integrated.
- Service every two weeks unacceptable. More frequent departures critical. (TDC '05 found minimum to be weekly.)
- Scheduling requirements indicate that 25% of the shippers are unlikely to switch to short sea shipping unless trucking service deteriorates drastically. (New York was mentioned as a particularly annoying chokepoint.)
- Incentive pricing for an equivalent (to trucking) short sea service could induce trial and premium pricing or a better transit time service could also be effective in attracting customers.

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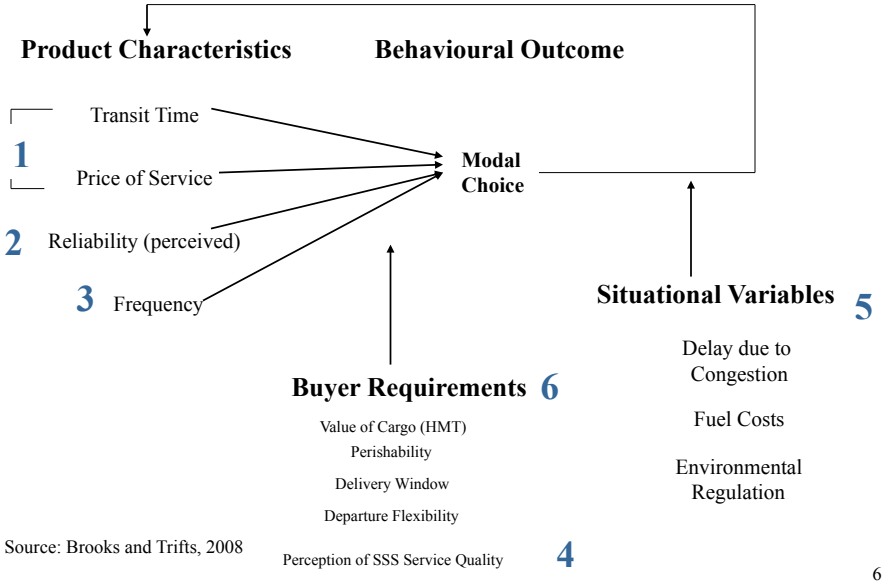
Mode Choice Model: Cargo Interest View



Source: Brooks and Trifts, 2008

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ISSS Service Profiles Tested in the Atlantic Canada–I-95 Corridor

Market	Truck	Short Sea
Short Distance (1)		
Halifax NS Gloucester MA		
Price of the Service (in USD) (2)	1,774	1,690
Total transit time (3)	30	30
Frequency	Daily	Twice a week
Medium distance (1)		
(Halifax NS - Philadelphia, PA)		
Price of the Service (in USD) (2)	2,559	1,739
Total transit time (3)	34	58
Frequency	Daily	Every five days
Long distance (1)		
(Halifax NS - Wilmington NC)		
Price of the Service (in USD) (2)	3,899	1,644
Total transit time (3)	56	72
Frequency	Daily	Once a week

Note: Sent to a census of Atlantic Canadian companies trading with the I-95 states.
Source: Brooks and Trifts (2008)

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Findings on Trade-Offs Made by Cargo Interests…

- **Splitting business between modes will occur**.
- Respondents allocated a greater percentage of their cargo requirements to the option described as having the greater **reliability** of service. (Depends on how much congestion there is; SSS seen as less congested.)
- **Frequency of departures** has a significant positive effect on the allocation of cargo requirements towards the option providing the greatest frequency. (Trucking is always more frequent!)
- Perceptions of ISSS actually improved the allocation of transport business in favor of ISSS. In this geographic market, **short sea is positively perceived**. (Contrary to US and EU findings)

Source: Brooks and Trifts, 2008

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Situational Variables (Fuel Costs and Congestion)

- Confirmed an "ecotax" on fuel costs would encourage switching to ISSS.
- Trucking costs would have to increase 29.4% before they would consider ISSS compared to an increase of 44.9% in transit time required.

  (Note: trucking costs have already approached this threshold then receded since the study was done.)
- Respondents place a much greater emphasis on price when choosing a mode of transportation as their tolerance for price increases is much lower than that for transit time increases.

  Question: How much has this changed now that everyone knows speed costs?
- Short Sea Shipping can be truck-competitive in corridors under 1,000 nautical miles under specific conditions.

Source: Brooks and Trifts, 2008

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Conclusions on Inducing Switching to Short Sea in Canada

- Geographically applicable (should not be construed as representative of other markets)
- There is a distance range where modal preference occurs in the price: transit time trade-off.
- The more reliable the service, the more likely the mode will be chosen
- Open-ended questions supported price, transit time and reliability as key service characteristics in modal switching in this market.
- In the East Coast market, ISSS is perceived positively.
- Frequency of departures means there will always be a bias in favour of truck if ISSS cannot get volume to improve frequency.

Source: Brooks and Trifts, 2008

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Factors for a Corridor of Opportunity in Australia? (Lessons from N. America)

- Freight distance
- Availability of interested secondary ports was an issue
- No competing rail corridor
- Traffic volume and congestion are drivers that can mitigate against inertia in changing modes

Source: Bendall & Brooks (2011)

Conclusions on a Process

- Identify congested corridors long enough that shipping can compete for cargo that is not time-sensitive or small enough volume that truck is the most likely option
- Conduct a survey of major cargo interests (owners, agents, distributors) to determine mode choice requirements and trade-offs
- Exclude high volume freight rail corridors where there is vibrant rail activity **if** mode choice study of cargo interests finds a preference for rail against short-sea (rail can have a speed, frequency and reliability advantages depending on the operator)
- Identify best opportunities for attracting traffic
  - (To/From permitted foreign operators in the case of Australia)
  - From road and rail providers

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First a Detour: Are there TEUs to be Attracted from Permits?

Year	SVPs	CVPs	Total Permits	SVP TEUs	CVPs TEUs	Total TEUs Permitted
2002-03	798	454	1,252	12,161	37,619	49,780
2003-04	681	350	1,031	7,908	38,810	46,718
2004-05	892	977	1,869	5,855	56,938	62,793
2005-06	1,133	1,291	2,424	16,501	32,758	49,259
2006-07	1,876	1,915	3,791	20,455	53,474	73,929
2007-08	1,814	1,372	3,186	6,694	37,776	44,470
2008-09	1,673	1,077	2,750	5,772	38,570	44,342
2009-10	1,771	1,101	2,872	13,828	55,347	69,175

Source: BITRE (2011), Australian sea freight 2009-2010, Table 1.3

Context: 6.1 million TEUs were handled 2010-11 in Australia's five largest container ports (~100X)

Sources of New Traffic—Attract Existing Permit Volume (2007-08 Permits)

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Port Pair (1)	CVP TEUs	CVP Voyages	SVP TEUs	SVP Voyages
Melbourne–Brisbane	9,851	162	9	3
Brisbane–Melbourne	0	0	0	0
Sydney–Adelaide	134	10	131	3
Adelaide–Sydney	0	0	0	0
Townsville–Brisbane	0	0	0	0
Brisbane–Townsville	10	1	0	0
Sydney–Fremantle	4,997	29	1,670	16
Fremantle–Sydney	460	19	114	15
Melbourne–Fremantle	12,476	64	1,973	43
Fremantle–Melbourne	593	26	54	13

Note: Townsville substituted for Cairns.Townsville is a freight generator.
Source: BITRE in response to data request April 2010. Reported in Bendall & Brooks (2011)

More Recent Research (CVP TEUs in 2009 and 2010)

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Load–Discharge Port	Jan-Jun 2009	July-Dec 2009	Weekly Average 2009	Jan-June 2010	July-Dec 2010	Weekly Average 2010
Melbourne –Brisbane	4,301	7,925	235	6,246	2,265	164
Melbourne –Fremantle	10,650	6,451	329	12,726	18,480	600
Sydney–Fremantle	4,250	3,945	158	4,200	7,078	217
16 other port-pairs	**9,145**	**7,072**		**11,444**	**4,398**	
Total	**28,346**	**25,393**		**34,616**	**32,221**	

Source: Brooks (2012)

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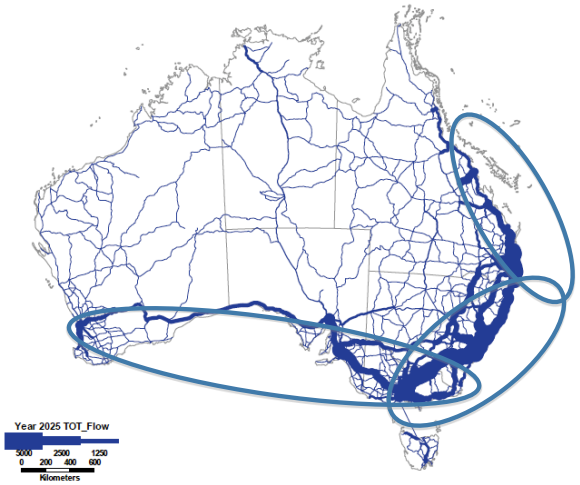
Remember Road Congestion as a Driver of Short Sea Development (Bendall & Brooks, 2011)

FIGURE 3.4 INTER-REGIONAL ROAD FREIGHT VEHICLE TRAFFIC ASSIGNMENT, 2025



Source: Commonwealth of Australia (2006)

Why?

- Long enough (sufficient distance)
- Congested?
- May have truck volume

Research gaps

- Road counts
- Current DC investment
- Switching incentives

Corridors of Promise (1)
Road versus Sea

AusLink Corridor	2025 Traffic (000 t)	Road Distance (km)	Sea Distance NM (kms)	Comments
Sydney–Melbourne	17,243	832	582 (1,078)	Deemed too short to be truck competitive.
Melbourne–Adelaide	14,399	713	514 (952)	Deemed too short to be truck competitive.
Sydney–Brisbane	11,828	947 (inland)	515 (954)	Deemed too short to be truck competitive.
Melbourne–Brisbane	5,325	1,690 (inland)	1,080 (2,000)	Min. daily number of heavy vehicles projected in 2025 is 1012.

Source: Columns 1-3 and min. daily numbers from Table 2.16 of Commonwealth of Australia (2006), column 4 from www.portdistances.com (with nm converted to km).

Corridors of Promise (2)
Road versus Sea

AusLink Corridor	2025 Traffic (000 t)	Road Distance (km)	Sea Distance NM (km)	Comments
Melbourne–Perth	3,728	3,423	1,681 (3,058)	Min. daily number of heavy vehicles projected in 2025 Melbourne–Adelaide is 1795.
Sydney–Adelaide	2,801	1,375	973 (1,802)	Min. daily number of heavy vehicles projected in 2025 is 1629.
Sydney–Perth	1,658	3,942	2,140 (3,963)	Min. daily number of heavy vehicles projected in 2025 is 1629 for Sydney–Adelaide.
Adelaide–Perth	1,530	2,692	1,343 (2,487)	The study concludes that traffic growth on this corridor will more likely accrue to rail.
Brisbane–Cairns	1,069	1,699	846 (1,567)	Min. daily number of heavy vehicles projected in 2025 is 718.

Source: Columns 1-3 and min. daily numbers from Table 2.16 of Commonwealth of Australia (2006), column 4 from www.portdistances.com (with nm converted to km).

Rail Corridors of Promise

F3 Number of weekly intercity intermodal services, by city-to-city pair, June 2008

Source: BITRE (2010)

Fact

- Strong competition Perth–Melbourne & Melbourne–Brisbane

But misleading

- No intrastate Queensland traffic as this is just interstate.

The Australian Research (Brooks, Puckett…, 2012)

- The research conducted in 2011 focused on three Australian corridors
  - Melbourne–Brisbane (congested)
  - Perth–Melbourne and Brisbane–Townsville (less congested with rail availability)
- With four proposed/existing services (truck, rail, foreign flag shipping and national flag shipping)
- Methodology: A discrete choice experiment with allocation of traffic to the four mode choices to assess willingness to pay/ willingness to accept parameters

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Identifies Shipper Preferences (7 Key Variables)

- Distance the freight is moved in kms.
- Transit time door-to-door in hours
- Frequency
- Direction (headhaul or backhaul)
- Reliability, two measures:
  - Probability of delivery within three hours
  - Probability of being more than 24 hours off-schedule
- Price offered
- Cargo nature (proportion of JIT), perishability and origin-destination patterns serve as contextual effects

Key point: Willingness-to-pay measures are based upon a context incorporating carbon pricing or road pricing, enabling a richer representation of preferences should policy-makers decide to introduce such mechanisms to encourage modal switching.

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Attribute Levels (% Deviation from Base Value)

Variable	Road	Rail	Coastal Shipping (Domestic)	Coastal Shipping (Foreign Flag)
Freight Rate	90%, 110%, 130%	95%, 105%, 115%	85%, 100%, 115%	85%, 100%, 115%
Transit Time	95%, 105%, 115%	95%, 105%, 115%	90%, 100%, 110%	90%, 100%, 110%
Frequency of Service (Shipments per Week)	30, 35, 40	15, 18, 21	1, 2	1, 2
Percentage of Shipments Arriving within 3 Hours of Schedule	90%, 100%, 110%	90%, 100%, 110%	90%, 100%, 110%	90%, 100%, 110%
Percentage of Shipments Arriving more than 24 Hours after Schedule	90%, 100%, 110%	90%, 100%, 110%	90%, 100%, 110%	90%, 100%, 110%

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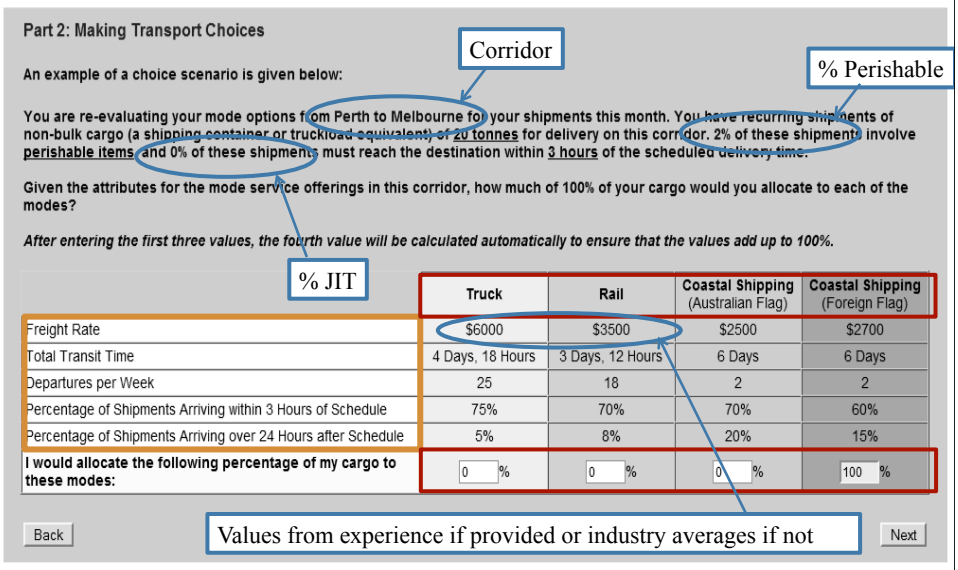
Example of Choice Scenario (There are 8)



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Results (n = 70)

- There was no evidence of corridor or decision-maker (retailer or forwarder or manufacturer) differences in preferences.
- All else equal, road is clearly preferred to rail and short sea.
- There was a stronger disutility for short sea in the Australian market.
- There was no distinct preference for national flag.
- Reliability: Road preferences are sensitive to delays of one day or more while rail and sea are sensitive to narrow delivery windows. Rail is sensitive to the range of transit times.
- Most interesting: Sensitivity to frequency of departure within the mode does not impact demand patterns once mode is chosen.

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Conclusions

- Inertia in demand patterns is a key factor in policy initiatives to induce modal switching
- Rail was the only mode where sensitivities to transit time variation were significant, and a willingness to pay estimate for transit time savings could be calculated. Rail operators could receive a small premium for providing faster service.
- Improved transit times by road and sea could encourage switching from rail.
- The largest potential for extracting a premium freight rate comes from preferences for improved on-time arrival (within 3-hours) and reductions in probability of delays beyond 24-hours. The high value placed on reliability offers rail and short sea hope for additional traffic given a focus by the operator on integration of services and thereby meeting delivery window expectations.

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Considerations for Chilean Short Sea Interests

- **Lessons from North American and European research**
  - Success through partnerships with land transport operators
  - Cargo interests will use coastal shipping if the trade-offs (price, transit time, flexibility, reliability, etc) provide competitive advantage to the cargo owner.
  - Citizens angry with trucking (pollution, safety) can induce change
- **Lessons from Australian research**
  - Congestion is not yet a driver of change in Australia
  - Cargo interests are more likely to favour road and rail in the absence of carbon taxes
  - Potential operators have vessel utilization and volume concerns; even a route that looks promising in aggregate may not have the volume in reality.

Key Studies

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Bendall, H. B. & M. R. Brooks (2011). Short Sea Shipping: Lessons For or From Australia, ***International Journal of Shipping and Transport Logistics***, 3 (4), 384-405.

Brooks, M. R., J.R.F. Hodgson and J. D. Frost (2006), ***Short Sea Shipping on the East Coast of North America: an analysis of opportunities and issues***, Halifax: Dalhousie University.

Brooks, M. R., S. M. Puckett, D. A. Hensher and A. Sammons (2012), Understanding Mode Choice Decisions: A Study of Australian Freight Shippers, *Maritime Economics and Logistics, 3, 274-299*.

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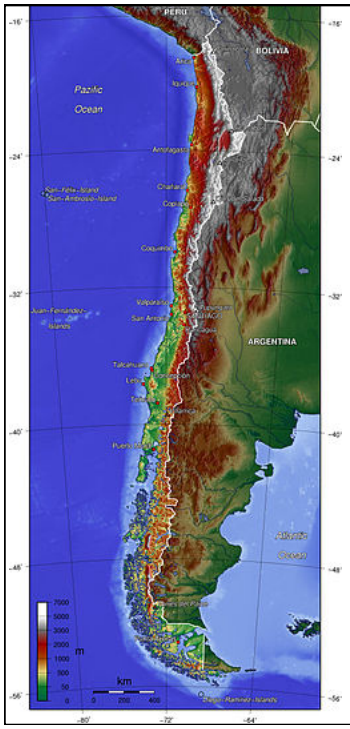
Brooks, M. R. (2012), Maritime Cabotage: International Market Issues in the Liberalization of Domestic Shipping, in *The Regulation of International Shipping: International and Comparative Perspectives: Essays in Honor of Edgar Gold*, A. Chircop, N. Letalik, T. L. McDorman and S. Rolston (eds), Leiden: Martinus Nijhoff Publishers, 293-323.

MariNova Consulting Limited (2005), *Short Sea Shipping Market Study (TP14472E)*, Ottawa: Transportation Development Centre of Transport Canada, September.



Discussion

What does this mean for Southern Chile?

Lessons for ship operators and cargo owners?

http://en.wikipedia.org/wiki/Geography_of_Chile

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Muchas Gracias!
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