THE EFFECT OF GOVERNMENT POLICY AND FUNDING ON SHORT SEA SHIPPING IN SCOTLAND

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ABSTRACT

This paper investigates why water freight in Scotland continues to decline despite the favourable policy environment and the availability of government funding. Since we know from the literature which barriers need to be overcome with this funding, the focus of the present research was to look in detail at the process of how government policy and funding are directed towards surmounting these hurdles. This objective was attained by studying the process of planning an intermodal freight service in the Forth Estuary near Edinburgh.

Qualitative data was collected through action research and stakeholder interviews, while quantitative data obtained through a feasibility study was then manipulated in scenarios to compare complementary policy measures. These two streams of data were then analysed through a theoretical framework to provide a means by which the current funding system could be analysed and improvements suggested. The application of theoretical approaches from other areas of transport will form an additional contribution to the maritime literature.

The results presented in this paper contribute to the literature by revealing issues related to using funding to achieve the aims of government policy. The study identified a number of problems with the way the current Scottish funding system relates to government policy, underlined by the fact that only a small portion of the annual freight grants budget is being spent. The funding system is reliant on ad hoc funding applications, possessing no mechanism for strategic identification of potential projects, and knowledge and responsibility are dispersed across many organisations, hampering cooperation. It was also found that the funding system favours infrastructure whereas a shortfall in operating costs compared to road haulage is the primary factor in preventing modal shift towards short haul services. In addition, the current method of calculating eligibility for operating subsidies was found to have no direct relation to financial need.

Keywords: Maritime policy, government funding, subsidy, modal shift, intermodal, short sea shipping (SSS)

1. INTRODUCTION

It remains a policy objective of the Scottish government to encourage the transfer of freight from road to rail and water as a contributor to its sustainability agenda (Scottish

Executive, 2006a). Yet in Scotland the mode share of road freight continues to rise, at the expense of more sustainable modes such as coastal shipping. In terms of domestic freight, total traffic at major ports has fallen by 12% since 2000 (Scottish Government, 2008b).[1] It must also be noted that the majority of intermodal freight in Scotland is coal (rail) and liquid fuels (water), therefore attracting containers from road to intermodal transport has been an ongoing problem. However regular unitised flows have been identified in the region being studied, forming the basis of the current research into whether the current funding system can support the shift of these flows to a more sustainable mode.

A 2007 survey showed that according to UK shippers the three main barriers to water freight were speed, infrastructure and cost (Sea & Water, 2007), and these results have been backed up by other studies (IWAC, 2008; Saldanha & Gray, 2002; Zigic & Bison 1999). The study also noted that freight forwarders have been finding a considerable lack of commercial interest from potential shippers, which highlights that there is a significant perception problem in the industry.

The Scottish government has attempted to help with the costs by offering two grant schemes. Freight Facilities Grants, which assist with capital funding, have been available for many years, and in 2005 Waterborne Freight Grants were introduced to assist with operating costs for the start-up period of a modal shift from road to water, where the scheme can be proved to become feasible within three years. However only a small percentage of each annual budget has been spent over the last decade (£3.7m out of £15.4m in 2008/9), indicating that the problem is not simply a lack of funding. Further research is therefore needed to determine how the funding process works in practice and whether it can be used more effectively to achieve the goal of government policy.

The paper begins with a review of maritime freight policy and funding in Scotland, followed by a review of the relevant literature, in order to clarify the research questions to be addressed in the study. The methodology is then explained, followed by the results, presented according to the data collection methods and then analysed using a theoretical framework that allows conclusions to be drawn regarding the efficacy of the current funding system. The paper concludes with policy recommendations and suggestions for future research.

2. POLICY REVIEW

UK government policy has been broadly in favour of sustainable transport for many years, and since devolution of transport powers to Scotland, this theme has been echoed by the Scottish government in its own policy documents. *A New Deal for Transport* (DETR, 1998) was the first transport white paper of the incoming UK Labour government, and its daughter paper *Sustainable Distribution: A Strategy* (DETR, 1999) advocated the use of economic instruments, planning guidance and regional transport strategies as key measures to encourage sustainable freight transport.

Modern Ports: A UK Policy (DETR, 2000), despite promising to “support sustainable port projects for which there is a clear need, with each looked at in detail on its merits” (p7)

[1] Comparisons must be made with care due to changes in reporting methodologies from 2000 with regard to water freight and 2004 with regard to road freight.

and to "encourage the use of ports by coastal and short sea shipping services," (p7) stated clearly that "it is not the government's job to run the ports industry." (p5) The document also declared that "port infrastructure can and should be commercially financed," (p9) and "we believe that port developments and port operations should not in general need public subsidy. Public money is not well spent in distorting competition between ports." (p10) Therefore the UK port model, in which most major ports are privately owned and operated, operates on market principles, leaving little room for government to invest directly. It is for this reason that various modal shift funding schemes have been devised that target actual services rather than general port investment, which is left to the private owners of UK ports. These will be discussed in the following section.

The most recent detailed government statement with regard to freight transport in Scotland was contained in the *Freight Action Plan for Scotland* (Scottish Executive, 2006b), which was based on the *Scottish Freight Strategy Scoping Study* (WSP, 2006), a large consultation with stakeholders in the freight industry. Issues raised in the scoping study included the importance for Regional Transport Partnerships[2] to utilise industry knowledge and experience in developing their freight strategies, and the integration of freight policy with other areas such as "economic development, land use, waste disposal and recycling." (p60)

The *Freight Action Plan* presented the summarised findings of the scoping study, reaffirmed the importance of current funding mechanisms, and pledged: "the Scottish government will ensure that sustainable freight transport considerations are fully integrated in the development of other policy areas such as land use, economic development, recycling and waste disposal." (p24)

Perhaps the key action resulting from the *Freight Action Plan* was the commencement of the *Strategic Transport Projects Review* (Transport Scotland, 2008). The projects identified in this review were incorporated into the *National Planning Framework*. For projects thus designated, it meant that "Planning authorities will be required to take the Framework into account when preparing development plans and it will be a material consideration in determining planning applications." (Scottish Government, 2008a; p1) The vagueness of this statement underlines the difficulty in developing public policy for privately operated ports.

Pettit (2008) concluded that the lack of a national policy for strategic port development has meant that "in the recent past, it is the development planning system that has had most impact on determining the development of UK ports." (p723) To some extent the Scottish government has attempted to resolve this issue through the identification of projects of national significance in the NPF, however since the document itself concedes that "the NPF is not itself a spending document" (Scottish Government, 2008a; p2), it remains unclear how their development will be taken forward. An issue therefore remains in terms of the strategic planning and identification of fundable projects, which will be considered in the present research.

In terms of regional transport policy and planning, SEStran, the regional transport partnership for the southeast of Scotland, has established a Freight Quality Partnership, based on guidance from the government published in April 2006, in which FQPs are described as aiming "to provide safe, efficient and environmentally-friendly solutions to

[2] Introduced in 2005, there are seven Regional Transport Partnerships in Scotland.

freight transport issues at a regional or local level." (Scottish Executive, 2006d; p2) The SEStran FQP is made up of local businesses and stakeholders in the freight industry and meets twice annually. Amongst its aims are "assessing the level of investment needed to improve freight movement within the region, and where it is needed most" and "assessing future demand for freight facilities in the SEStran region, and preparing strategies to meet it." (SEStran, 2008; p62)

Regarding local issues, Fife Council's *Local Transport Strategy* recognises that freight planning is related to national and regional planning decisions. However it remains involved with SEStran's FQP and recognises "the need for convenient, key rail and port interchanges and associated rail & sea freight services to promote transfer of freight between road and rail and between road, rail and sea." (Fife Council, 2006; p39)

3 FUNDING REVIEW

Freight Facilities Grants (FFG) exist to contribute towards the costs of freight handling infrastructure that is required to assist in shifting freight from road to either rail or water, in cases where the water/rail option would not otherwise be financially feasible.[3] The financial requirements as well as the environmental benefits (defined as the number of lorry trips saved multiplied by the route valuation calculated on the DfT website[4]) need to be calculated, and the grant will pay towards the lower of these two figures, up to a maximum of 50% of the total cost.

Waterborne Freight Grants[5] (WFG) became available in Scotland in 2005. They exist to fund shortfalls in operating costs which would enable the setting up of a scheme that will shift freight from road to water, with the proviso that the scheme becomes viable within three years. Like FFGs, the grant amount will be for the lowest of the environmental benefits and the financial need. There have only been three recipients of WFGs in Scotland during this time, two large grants for the Rosyth-Zeebrugge ferry (£578,960 to the original Superfast operator and €2m to the new operator Norfolkline) and £19,604 for a small canal research trial. The underutilisation of the grant scheme presents a problem because regardless of the infrastructure investment, if water services are unprofitable no one will enter the market. But even though WFG funding is available for that very purpose, there has not been a single active domestic freight service represented. An international RoRo ferry and a canal trial were the only recipients. Clearly more research is required on how the funding can be better used to encourage shippers to consider water freight. Therefore the primary focus of this paper is to examine the inputs into the system. However before continuing, the outputs will briefly be considered.

Since 1997 in Scotland, a total spend of £19,154,083 on water-related FFGs and £2,379,697 on WFGs has achieved the removal of 8,118,000 lorry miles each year, equating

[3] More information on all Scottish freight funding can be found at the website. http://www.scotland.gov.uk/Topics/Transport/FT/freightgrants1
[4] The EB calculator is available on the DfT website: http://www.dft.gov.uk/eb-calculator/
[5] WFG funding for inland waterways (under which category the Forth Estuary is included) has now been incorporated into the new Mode Shift Revenue Support Scheme (MSRS), but eligibility rules remain similar therefore there is no change from the point of view of the current project.

to a cost of £2.65 to remove one lorry mile annually.[6] Furthermore, when we consider that the total number of HGV miles in Scotland is currently 1,738m (Scottish Transport Statistics, 2008), a removal of 8.1m to water (costing £21.5m) and 23.0m to rail (costing £34.9m) amounts to 31.1m out of 1,738m, or 1.79% for a total spend of £56.4m.[7]

The allocated budget for Scottish freight grants and the amount spent, divided into infrastructure and operating subsidies for water and rail, is presented in Table 1. The funding includes capital funding through FFG (water and rail) and operating subsidies through WFG (water), TAG (rail up to 2006) and REPS (rail from 2007 onwards).[8] A small amount of the budget is also used for purposes other than grants, but figures for such sundry spending were not provided in the budget.

Table 1. Scottish Freight Grants Budget and Amount Spent Per Year (Source: Scottish Govt Freight Grants Dept)

Year	Budget	Infrastructure rail (FFG)	Infrastructure water (FFG)	Operating rail (TAG/REPS)	Operating water (WFG)	Total Spent	Unspent	Unspent %
99/00	6,100,000	8,506,000	4,410,000	0	0	12,916,000	Overspend	NA
00/01	7,850,000	10,290,000	693,000	0	0	10,983,000	Overspend	NA
01/02	10,803,000	289,000	10,969,000	950,804	0	12,208,804	Overspend	NA
02/03	13,121,000	2,419,900	0	707,651	0	3,127,551	9,993,449	76.2
03/04	15,438,000	6,072,000	0	387,998	0	6,459,998	8,978,002	58.2
04/05	15,638,000	137,678	0	227,495	598,564	963,737	14,674,263	93.8
05/06	16,400,000	2,219,000	490,000	364,795	0	3,073,795	13,326,205	81.3
06/07	13,900,000	2,400,000	2,300,000	142,496	0	4,842,496	9,057,504	65.2
07/08	13,900,000	0	0	592,903	0	592,903	13,307,097	95.7
08/09	15,400,000	2,559,902	292,083	860,564	0	3,712,549	11,687,451	75.9
09/10	15,400,000	0	0	994,100	1,781,133	2,775,233	12,624,767	82.0
Total	**£143,950,000**	**£34,893,480**	**£19,154,083**	**£5,228,806**	**£2,379,697**	**£61,656,066**	**£82,293,934**	**57.2**

It can be seen from the table how little has been spent in recent years, therefore the reason behind the funding system's failure to achieve significant modal shift is not a matter of lack of funding. This finding underlines the importance of the present research into how the funding system operates in practice, in order to determine what factors are preventing more grants being made and hence more modal shift being achieved.

[6] Note that the payment is a one-off while the lorry miles removed will continue for as long as the service remains in operation.
[7] Figures on road miles removed to rail are only available for FFG (infrastructure grants). They are not kept for TAG/REPS (operating subsidies).
[8] Some discrepancies may result from the changeover in responsibilities from the DfT (UK) to the Scottish Executive, therefore some projects may show up in different lists. Amounts given in this table only include actual spend by the Scottish government – some projects however were part-funded by the Scottish Executive/Government and the DfT. Furthermore, grants are generally spread over a period of time. In this analysis the grants have been listed in the year they were awarded.

While the principal aim of the project is to apply for funding from the Scottish government, there is the possibility of applying for EU funding, through Interreg[9] or Marco Polo.[10] It is interesting to note that eligibility for Marco Polo funding has been lowered in successive years in order to attract more applications because the annual budget was not spent. This shows that attracting applicants is not just a Scottish problem. However, whereas in Scotland nothing has been done, in the EU the response was to make the funding easier to obtain.

4. LITERATURE REVIEW

4.1 Government & Industry Bodies

Surveys have been undertaken to determine issues with the attractiveness of intermodal transport (see introduction), and various actions have been proposed by industry organisations. Sea & Water advocate strategic identification and development of intermodal interchange sites (Sea & Water, 2006), and specifically prioritising infrastructure development in the planning system. (Sea & Water, 2008). The Inland Waterways Advisory Council suggest that the government needs to be more proactive in setting up water networks before potential customers will consider water as a viable mode, and specifically recommend that the government "should examine the economics of freight transport and make the necessary adjustments to encourage companies to choose the water option." (IWAC, 2008; p15) Likewise, a report produced on behalf of the government in 2002 analysed the funding system and recommended that a more proactive and strategic approach be taken by government rather than simply waiting for ad hoc funding applications. (MDS Transmodal, 2002)

4.2 Academic Literature

Baird (2005) writes that the lack of a consistent maritime policy in Scotland has prolonged what he considers the unfair competition between unsubsidised water routes and subsidised road networks. In terms of coastal shipping, he reports on the results of the UK Marine Motorways Study, which found that public support would be required to develop such a service, to share the risks of setting up these routes and to develop port infrastructure. More specifically for the current study, some points highlighted by Baird in his research into coastal shipping include the importance of direct government involvement in the identification and sourcing of potential investment in port and route development: "government could consider the option of highlighting potential routes and related funding opportunities to the transport sector, possibly through a competitive tender exercise". (Baird, 2007; p298)

[9] Interreg IVB is a European funding mechanism that supports transnational projects in order to promote cooperation and knowledge transfer. It is not limited to transport initiatives, and can be used to fund demonstration projects or trials. For more details visit the website. http://www.nweurope.org/

[10] Marco Polo is a European funding mechanism designed to support modal shift. Like WFGs, it can be used to fund the shortfall in operating costs between road haulage and intermodal transport. For more details visit the website. http://ec.europa.eu/transport/marcopolo/home/home_en.htm

Looking at the wider European context, Ricci and Black (2005) suggest three factors that have prevented the success of government funding for water freight: “the inadequacy of the existing infrastructure, . . . the intrinsic complexity of the industry . . . [and] the extensive role of the private sector.” (p246) Their study of intermodal transport corridors in Europe concluded that the internalisation of external costs would aid the competitiveness of intermodal transport with road, however measures to increase the efficiency of intermodal transport would also need to be added to make intermodal transport sufficiently attractive to achieve significant modal shift. Similar issues were identified in the USA by Perakis & Denisis (2008), and the study of intermodal transport research conducted by Bontekoning at al. (2004) recommended further research on “the effect of financial support of the intermodal transport on its attractiveness” (p24) as well as policy formulation in areas such as modal shift.

Saldanha & Gray (2002) note the importance of cooperation between port authorities and the government, particularly in terms of translating favourable legislation into practical projects. Their Delphi study of industry operators also revealed the need for water freight funding to achieve a level playing field with regard to roads, cooperation in the ports industry to lobby government for this aid, as well as the need to promote water freight to make it more visible. Finally, “the panel was unanimous that the secretive nature of the business and fierce competition is a major issue that needed to be resolved.” (Saldanha & Gray, 2002; p85) Likewise, Van der Horst & de Langen (2008) note that “shippers, forwarders, and container shipping lines are often unwilling to commit themselves to new services, either through opportunism or concern about benefits for competitors.” (p116) Gouvernal et al. (2010) highlighted the importance of intermediaries such as freight forwarders to the development of short sea shipping due to the irregularity of loads.

Van Schijndel and Dinwoodie (2000) investigated the effects of congestion on operating costs and found that the increase in wages of drivers due to increased journey times showed the biggest impact. Other relevant findings were the importance of a well-developed service to attract modal shift, as well as the problem of overcoming inertia in the industry due to existing contracts with road haulage companies which precludes the impetus to develop different logistics systems. Similarly, Regan & Golob (2000) found in a survey in California that maritime intermodal carriers are disproportionately affected by congestion because they are at the mercy of specific time windows with regard to port operation. However Runhaar and van der Heijden (2005) found that over a proposed ten-year period, even a 50% increase in transport costs would not make producers any more likely to relocate their production or distribution facilities. The authors go on to conclude that while their results do not mean that governments should abandon financial policy instruments, it is important that expectations of success in similar projects remain reasonable.

Musso et al. (2006) investigated the economics of port investment based on different types of funding, different expectations and different methods of evaluation. Their discussion of the nature of infrastructural investment highlights that there is therefore a need for joint evaluation, the public investor analysing the benefits to society, and the private investor analysing the profitability of the proposed investment. Important elements of this evaluation that are considered by the authors include not just approving a particular project but the possibility of excluding another due to limited funding, as well as the necessity of decision-making at a local level.

Pettit & Beresford (2009) charted the development of ports from gateways to logistics hubs, highlighting the importance of logistical services within ports as a means of remaining competitive and stressing that ports must be seen as part of the supply chain. In their research they found a difference in approach in the UK where value-addition was not the traditional focus of the port, whereas that approach has been more common elsewhere in Europe. Similarly, Notteboom & Rodrigue (2005) researched the regionalisation of ports and found that it was not driven by the ports themselves but by "logistics decisions and subsequent actions of shippers and third party logistics providers." (p306) Yet they go on to conclude that the role of the port authority should be to engage with all parties in order to be involved with these logistics decisions to achieve the best result for the competitiveness of the port.

Any consideration of different policy and funding models needs to take account of the fact that a major barrier to entry in the shipping market is the business model of the shipper and/or logistics provider. Policy and funding are useless if they are not able to integrate with commercial decisions taken in the industry. It needs to be remembered that the transport part of the logistics chain has already been fully integrated in the decisions of the logistics provider, therefore it is not easy simply to swap from road to water because it can affect other decisions that have already been made. Therefore research into government funding for intermodal freight transport needs to engage with the issue of how actors in the industry engage with government planning, policy and funding, and how their own decisions are influenced by government actions.

4.3 Theoretical Framework

A useful theoretical framework is provided by Gunn (1978), in which the author presents ten conditions for the successful implementation of policy measures. Two conditions (tasks fully specified in sequence and perfect compliance) will not be considered in the present study as they are more relevant to the top-down model of policy implementation proposed by Gunn, leaving eight categories:

1. Favourable external circumstances.
2. Adequate time and resources allocated at the outset.
3. Actual availability of these resources.
4. Valid theory of cause and effect.
5. Cause and effect are directly linked.
6. Single implementation agency.
7. Understanding of, and agreement on, objectives.
8. Perfect communication and coordination.

Ison & Rye (2003) used Gunn's framework to assess the implementation of travel plans and congestion charging in the UK, and found some additional conditions for success:

9. Monitoring.
10. Presence of a political champion.
11. Political stability.
12. Trust.
13. Ongoing public relations.
14. Timing.

Furthermore, Gaffron (2003) conducted similar research to Ison and Rye, investigating the implementation of cycling and walking policy in local authorities in the UK. The resulting paper proved instructive regarding the current research design because it did not examine the outputs of these polices such as bicycle usage but rather studied the inputs. It analysed the implementation process by surveying local authorities to understand how national policies filtered down into actual implementation at local level. A similar approach will be taken in the present research. This application of theoretical approaches from other areas of transport literature will form a contribution to the maritime literature.

5. METHODOLOGY

Qualitative methodologies have proved popular for gauging the factors affecting intermodal transport, including Sea & Water (2007), Regan & Golob (2000), IWAC (2008) and Zigic & Bison (1999). The *Scottish Freight Strategy Scoping Study* (2006) utilised a mixture of qualitative methods to gather data on perceptions of stakeholders in the freight industry, including in-depth interviews, postal surveys and themed workshops. Other studies have used expert interviews and Delphi studies (e.g. Saldanha & Gray, 2002), and of course quantitative methodologies for economic assessment and comparisons of different policy scenarios have been applied to the study of intermodal freight (e.g. Ng, 2009; Macharis and Pekin, 2009; Groothedde et al., 2005; Janic, 2007; Blauwens et al., 2006; Parola and Sciomachen, 2009; Tsamboulas et al., 2007). Mixed methodologies have also proved useful (e.g. Van Schijndel and Dinwoodie, 2000; Runhaar and van der Heijden, 2005).

A mixed methodology was adopted for the current study. Action research was undertaken during the process through minuting meetings, recording decisions taken, collecting data and adding observations on the roles played by the key stakeholders. The aim of action research is to examine behaviour, to discover what people actually do, rather than what they say they do (Silverman, 2005). The process was then discussed during interviews with key stakeholders as well as other port authorities and previous funding recipients.

Quantitative data was collected through a feasibility study of the proposed intermodal service, allowing a number of scenarios to be built and compared. These were based on

findings from the literature review, policy and funding review, action research and interviews, and their aim was to examine the effect of other kinds of policy mechanisms or funding regimes on the feasibility and hence attraction of the proposed water service. Detailed cost data cannot be presented due to commercial sensitivity, however the impact of these costs on the funding process will be discussed.

The case of a water freight service from Methil on the Fife coast to Scotland's principal international port at Grangemouth was chosen for a number of reasons. Methil is an under-utilised port and is also located in a deprived area, which makes it a good candidate for regeneration that can help to bring economic activity to the area. Freight demand in Fife is expected to rise by 4-6% over thirteen years (Scott Wilson, 2009) which will put a considerable strain on pinch points in the network, notably the Forth Road Bridge. Traffic on the Forth Road Bridge has reached capacity at around 24m crossings per year (FETA website) and very little growth is possible; increased usage will simply worsen the already significant congestion problems. (Scottish Government, 2006c) It therefore appeals to government priorities at local, regional and national level, and much can be learned about the chances of success for other projects in Scotland.

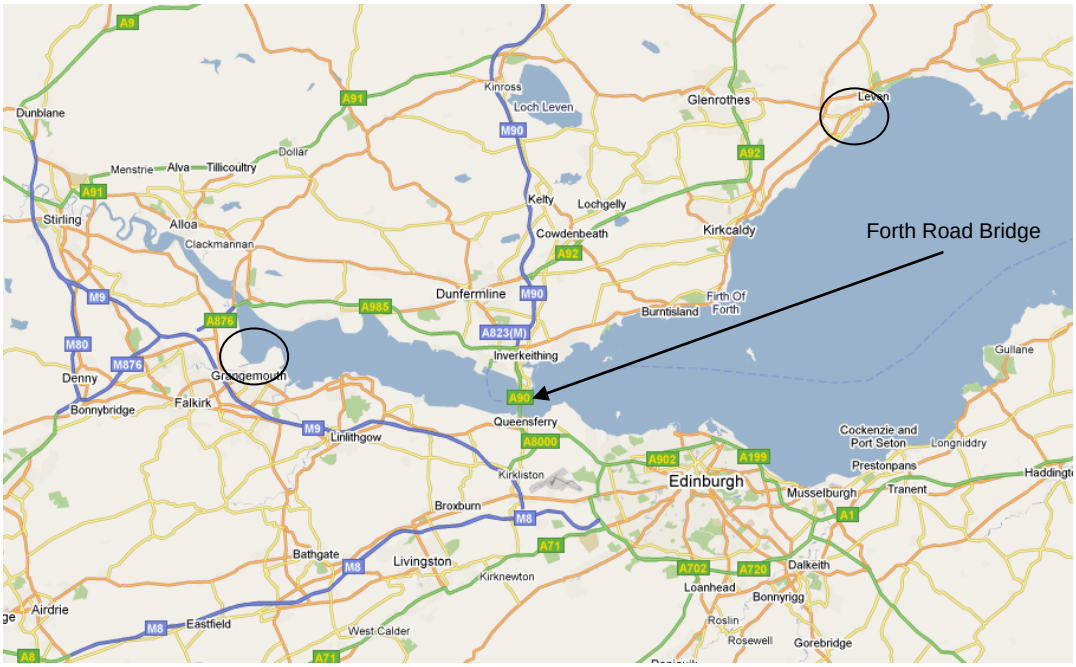

Figure 1 – Map of proposed route, highlighting the ports at Methil and Grangemouth. Source: Google Maps

Breakeven distances for intermodal transport are generally considered to be in the region of 500km (Van Klink & Van den Berg, 1998), however this distance can be shortened by other factors such as removing the road leg at one end and the existence of regular unitised demand to ensure high rates of utilisation, both of which are present in the current case. The aim will be to find how close the service is to feasibility, then to consider whether complementary policies or modal shift funding can bridge that gap, and finally to reveal whether other issues apart from cost are involved in the potential modal shift decision.

6. RESULTS

6.1 Action Research & Interviews

It was found through action research and interviews that state aid rules and the UK port model make it difficult for the government to be directly involved in port development. Partly driven by the above, no national maritime policy exists for Scotland, as was suggested by the literature. The funding system has been identified as complex, while knowledge and responsibility are too dispersed across organisations to make a significant impact, as illustrated by the fact that only a small portion of the annual freight grants budget has been spent each year. The most important requirement to promote intermodal transport, according to the interview data, was to demonstrate that water can be cost-effective.

The local authorities are not directly involved in planning water freight services. Both the action research and the interviews showed that Regional Transport Partnerships can be very useful as facilitators but it depends on the project and what help is required by the applicant. National government is not involved in terms of directing the funding and identifying schemes, but the freight grants administrators are available for support during the funding application process. Building relationships and the informal nature of much of the process has been noted as both a positive and a negative factor in influencing freight grants. On one hand the personal help is valuable, but on the other, the subjectivity of the process can be called into question. Perhaps the most important finding was that different priorities were identified between tiers of government. For example road miles are the national priority and the sole criteria for funding, whereas congestion and economic development are significant priorities at the local and regional level. This separation of freight grants from other policy areas seems in direct contradiction to the aim of the government's *Freight Action Plan*: "the Scottish government will ensure that sustainable freight transport considerations are fully integrated in the development of other policy areas such as land use, economic development, recycling and waste disposal." (Scottish Executive, 2006b; p24)

Scottish ports still very much direct their own development and do not rely on government policy or funding. The UK port model can present a problem as shareholder value in privately-owned ports can conflict with long-term investment. Government motivation to increase usage of water freight is complicated by the issues raised by using its resources for the benefit of private port operators. It was found throughout the process that the dispersal of knowledge and responsibility across a number of government bodies leads to problems with coordination and exacerbates the existing problem of integrating port development into a national strategy.

6.2 Feasibility Study & Scenario Comparison

Cost data from the feasibility study cannot be presented due to commercial sensitivity, however the impact of these costs on the funding process can be discussed. The feasibility study and scenario comparisons revealed that, while it has been widely suggested that complementary policies such as road pricing are required to enable water freight to compete with road, short sea shipping will continue to struggle even with government help.

This is due primarily to the fact that longer distances are required to spread the fixed costs and allow such services to compete with road. This issue is not easy to solve with a single policy measure, however it is possible that cumulative effects (some of which, such as market conditions, are outwith the government's direct control) can achieve a greater impact.

It was clear in the feasibility study that the pre-haul road leg of the intermodal service contributed significantly to the costs. Therefore, as mentioned in the literature, and supported by the interview data, it would be desirable to develop policies or provide funding that would help to attract businesses to locate facilities in the port hence removing the pre-haul cost. However it is not possible for government funding to be directed towards that aim under current regulations.

The initial assessment shows the service to be unfeasible due to the impact of the pre-haulage cost as well as handling costs (although using RoRo can help to address these issues). Infrastructure funding (FFG) could contribute significantly towards the capital costs, however the shortfall in operating costs would not be bridged by eligible WFG/MSRS funding under current cost structures. The gap between DfT Environmental Benefits (which determine funding eligibility) and the required operating subsidy suggests that it is possible that other small-medium services may also be precluded from obtaining subsidy. Moreover, the route valuation that underpins the funding evaluation is based on average values per road type, rather than basing the figure on a knowledge of the area. In this case, the route traverses a bridge already at full capacity, which is not taken into account.

While complementary policies are desirable, the scenario comparisons showed that short distance services would require quite stringent levels of complementary policy measures to be made feasible. Scenarios tested included an hour's congestion per round trip, road pricing (based on either the current German lorry charging scheme or a per-mile breakdown of the current English M6 motorway charge), and bridge tolls (£2 each way as used to be charged on the Forth Road Bridge before the Scottish government removed it, £15.30 each way to cross the river Severn and £18.30 each way to cross the Humber). With or without such policies, intermodal transport still requires distance to break even with road, and the distance of roughly 70km between Methil and Grangemouth is not sufficient. While it is found in much maritime research that perception and habit are important deterrents to the use of shipping, the figures show that short distance intermodal routes are difficult to operate economically, and will remain so even with complementary policies.

7. THEORETICAL FRAMEWORK

The following section applies to the current study the theoretical frameworks developed by Gunn (1978) and Ison & Rye (2003) on the key factors for successful policy implementation.

7.1 External Circumstances Do Not Impose Constraints

This condition refers to whether certain facts about the situation preclude the effective application of the proposed policy. The condition is not met in this case for two reasons. Firstly, the distances in Scotland are often too short for intermodal transport to compete with

road. Furthermore, this shortfall in cost between road haulage and short haul intermodal freight is often too large to be bridged by government funding, as found in the feasibility study. Secondly, the UK port model and state aid rules that prevent the government from becoming directly involved in the strategy and investment of port development. Therefore external circumstances do impose constraints on any potential policy intervention.

7.2 Adequate Time And Sufficient Resources Made Available

It has been shown that the allocated freight budget has not been spent every year, therefore it cannot be argued that more financial resources are required as yet. Additionally, staff resources are available to a prospective applicant through the freight grants team as well as other organisations such as Scottish Enterprise and regional transport partnerships like SEStran.

7.3 These Resources Are Actually Available

While information is publicly available and staff are present at various government departments and organisations, these resources are not actually fully available in the sense that the knowledge, clarity and transparency of responsibility required for potential applicants to gain a full picture of the funding system and direct a project are not present due to the dilution of knowledge and staff responsibility over a number of areas. This problem is more directly addressed under the condition of a single implementation agency.

Similarly, while a generous annual budget is available, and indeed remains unspent most years, the system whereby this funding is awarded based on the DfT's calculation of Environmental Benefits means that few schemes will be eligible for anything near the required funding.

7.4 Policy Guided By A Valid Theory Of Cause And Effect

The funding system is focused primarily on infrastructure, and it was found in the feasibility study that the service would qualify for enough funding to enable the purchase of infrastructure to support a RoRo service, if not the full equipment required for container handling. However it was clear that operating costs are the primary issue therefore the funding system is not based on targeting the heart of the problem. Furthermore, funding can only be sought to shift an existing road flow onto water or rail. Funding cannot be used to support a development that will create a new rail or water freight movement, which means that any new industrial or manufacturing site development is likely to favour the use of road. This is another example of an invalid theory of cause and effect.

7.5 The Link Between Cause And Effect Is Direct

As the previous condition has not been met, this condition is not applicable.

7.6 Single Implementation Agency

This condition represents perhaps the most notable absence, with government responsibilities split to the degree that freight grants relate purely to road miles and not to other policy areas, in contradiction to the government's *Freight Action Plan*. Furthermore, there exist three levels of transport governance, as well as other organisations such as Scottish Enterprise. Implementing freight policy through the funding system and administration team, then linking the funding to the identification of strategic projects becomes extremely difficult. In order to achieve better results, greater centralisation of knowledge and responsibility must be achieved.

7.7 Complete Understanding Of, And Agreement On, Objectives

The funding system itself has clear objectives: to fund the shortfall in costs according to Environmental Benefits in order to reduce road miles. However clear agreement on these objectives does not exist. Local and regional transport governance bodies, as well as others such as Scottish Enterprise, want to achieve objectives such as congestion reduction and economic development. Therefore there is a conflict, exacerbated by a lack of centralised knowledge, that precludes clear pursuit of these objectives.

7.8 Perfect Communication And Coordination Amongst Partners

As discussed already, there is a serious problem regarding the dispersal of knowledge and responsibility amongst organisations, therefore communication and coordination is extremely fragmented.

7.9 Monitoring

The absence of a national policy and any strategy for identifying potential projects was noted, as well as the fact that the annual budget is not being spent. Therefore the results of the funding system are clearly not being monitored to ensure that objectives are being achieved.

7.10 Political Champion

As the grants system is based on individual applications and judged solely on road miles removed, there exists small potential for the impact of political support for an individual scheme. What is required is the support of national politicians who are in a position to focus government attention on issues regarding freight policy, which is not in evidence in Scotland.

7.11 Political Stability

The freight grants policy has not changed between Scottish administrations therefore this condition has been met. However it could be argued that there has been no change in

policy because it is so low on the political agenda. In this sense change is required rather than stability, therefore this condition will be considered as having an overall neutral effect.

7.12 Trust

No issues were identified relating to trust of others to fulfil their roles in the process.

7.13 Ongoing Public Relations

As it relates to engagement with industry, in terms of the dissemination of knowledge or identifying projects and encouraging their development, it can be concluded from the above results that public relations needs to be improved.

7.14 Timing

From one perspective, this condition can be said to have been fulfilled in the sense that modal shift is becoming more popular and companies are beginning to be interested in changing their habits. Clearly, if shippers are not interested, the feasibility of the service becomes a moot point. Current concerns about climate change and corporate responsibility mean that the opportunity to attract applicants is improving. Furthermore, public opinion is very slowly coming to terms with the prospect of road pricing so if that ever becomes an eventuality, water freight will become more feasible, enabling the grant system to achieve better results. On the other hand, all these positive developments of the last few years have now been negated by the arrival of an economic recession. Therefore in the present economic climate this condition is not met.

Table 2. Theoretical Framework

No.	Condition	Present	Partial	Not Present
1	External circumstances do not impose constraints.			✓
2	Adequate time and sufficient resources made available.	✓		
3	These resources are actually available.			✓
4	Policy guided by a valid theory of cause and effect.			✓
5	The link between cause and effect is direct.		NA	
6	Single implementation agency.			✓
7	Complete understanding of, and agreement on, objectives.		✓	
8	Perfect communication and coordination amongst partners.			✓
9	Monitoring.			✓
10	Political champion.			✓
11	Political stability.		✓	
12	Trust.	✓		
13	Ongoing public relations.		✓	
14	Timing.			✓

Table 2 shows that there are many areas in which the funding system needs to be improved to increase the chances of more successful applications and therefore achieving the objective of more road miles saved. When funding systems do not produce the desired results, especially in a policy area in which the shortfall of costs is the primary problem, the reason is often assumed to be financial. However in this case it has been found that the full budget has not been spent, and the table above clearly illustrates that there are many areas in which the funding mechanism does not address the problems that must be overcome in order to achieve the policy aims. It does not necessarily follow that a policy cannot be successful unless it fulfils all or most of the above criteria. However the framework is a tool that highlights the areas at which improvements should be targeted. Additionally, the framework reveals areas such as external constraints that will remain a problem regardless of policy or funding, and these constraints need to be incorporated into reasonable expectations of policy interventions.

8. IMPLICATIONS FOR POLICY

A number of policy implications can be drawn from the research, beginning with the need for a national maritime policy. While difficulties are acknowledged in developing government strategy due to predominantly privately owned ports in the UK port system, funding needs to be better targeted by identifying strategic developments rather than awarding funding on an ad hoc basis. Furthermore, greater efforts need to be made to centralise knowledge and responsibility. Better public relations is required to spread knowledge of the funding system throughout industry, as well as greater integration between interested parties, rather than an unstable reliance on informal relationships.

Scottish funding could also be better integrated with EU funding to enable the greatest number of schemes to be funded one way or another, or combined where suitable. Better provision of knowledge relating to these relations and eligibility would enable more bids to come forward. Particularly, it must be recognised that there is a problem attracting ship operators to come forward with bid proposals, therefore consortia such as these (e.g. involving research institutions, government bodies, ports, shippers and carriers) are going to be instrumental in successful bids. The consequence of this result is that knowledge and responsibility will continue to be dispersed unless projects are proactively identified as part of a strategy that brings these key actors together.

In terms of the funding system itself, changes need to be made in funding eligibility for operating costs to enable more of the freight grants budget to be spent. While it is not suggested that huge operating subsidies should be awarded to unfeasible projects, using a measure other than the current Environmental Benefits system could potentially make some small-medium schemes viable.

Complementary policies such as road pricing and bridge tolls will undoubtedly increase the viability of water freight and are therefore to be recommended. However in this case these policies would exert only a small influence on short distance shipping, and they are in any case politically difficult to implement.

9. FUTURE WORK

It has been suggested above that eligibility for operating cost funding should be judged by a different measure, but in order to determine what level would be practical, research should be conducted amongst shippers, ship operators and ports to identify other small-medium freight potential that might be on the fringes of feasibility. These potential services should be analysed to determine whether the current system should be increased to make more schemes fundable, or a new measure adopted.

The suggested project could then develop along the lines of the research design of Macharis & Pekin (2009). Their work used GIS to build a model of different freight routes across Belgium and experimented with different costs and subsidies on specific routes. This method could be used to build a more detailed map of potential and actual Scottish coastal shipping in order to illustrate more effectively what unit costs and top-up funding are required for different services and how other flows can be identified.

Detailed research on the success or otherwise of strategic funding for maritime freight elsewhere in Europe would also be beneficial. Complementarity between Scottish/UK and EU funding requires further research, particularly in terms of whether state aid rules are preventing desirable government investment in ports and shipping. A survey of EU demonstration projects would also be profitable to learn whether spending Scottish freight grants on such projects could have beneficial impacts here.

Studying the process by which government policy is enacted through its funding regime has provided insights that have strengthened previous research, but themselves require to be further strengthened by additional studies, as noted above. However many of the results are not case specific and can therefore be considered valid. Future research will increase knowledge of strategic uses of funding and hence the likelihood of more successful intermodal freight services that will then contribute towards the overall policy aim of encouraging modal shift and reducing road miles.

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