Funding and Income Sources for a Selection of Overseas Inland Waterways

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What is the Inland Waterways Advisory Council (IWAC)?

IWAC is a statutory public body providing independent advice to the UK Government, Scottish Government, navigation authorities and other interested parties on all matters it considers appropriate and relevant to Britain's inland waterways.

IWAC was created in April 2007 by the Natural Environment and Rural Communities Act 2006. Its predecessor organisation was the Inland Waterways Amenity Advisory Council which was created in 1968. IWAC is supported by the Department for Environment, Food and Rural Affairs (Defra) and the Scottish Government.

In England and Wales, IWAC's remit covers all of the inland waterways such as:

- canals (including those managed by British Waterways, canal companies, local authorities and smaller independent bodies);
- rivers (including those which are the responsibility of the Environment Agency, British Waterways and port authorities);
- the Norfolk & Suffolk Broads; and
- the navigable drains of the Fens.

In Scotland, IWAC's remit covers inland waterways that are owned or managed by, or which receive technical advice or assistance from, British Waterways.

What is IWAC's role?

IWAC's role is to ensure that the inland waterways are sustainably developed to meet the needs of all who use and enjoy them. Once used mainly for freight transport, inland waterways now have a strong recreational and amenity use. They are an effective catalyst for the regeneration of local economies, acting as a distinctive focus to bring economic, social and environmental benefits to cities, towns and rural communities.

IWAC has published reports which include: balancing the needs of navigation and aquatic wildlife; awareness and appreciation of the canal network in Scotland; information and communication technology for the UK's inland waterways plus reducing carbon dioxide emissions by moving more freight onto inland waterways.

More about IWAC

Please visit our website at **www.iwac.org.uk** for further information about IWAC and to see copies of its reports.

Acknowledgments

The author David Edwards-May and study team wish to express their gratitude to the many individuals and organisations who kindly devoted their time not only to our interviews but also to subsequent research, finding answers to the many detailed questions which were raised, relating both to the actual amounts spent per year on different waterways and to the mechanisms of application or delivery of funding for recreational inland waterways.

We are also grateful to the report's Project Steering Group of the Inland Waterways Advisory Council, in particular David Dare, John Pomfret and Alison Woodhams, for their time, confidence and patience during the process, which proved to be complex in certain cases.

We hope that the present report will be of use to planners and inland waterway decision-makers.

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Contents

1. Purpose of the study

This report analyses the funding and income arrangements in place for overseas inland waterways that are comparable to those in Britain, being used principally for amenity purposes. High-capacity waterways that are part of national and trans-European national transport infrastructure are excluded from the analysis, since the principles and argumentation for funding proceed on an entirely different basis.

The study covers inland waterways of widely varying dimensions and management regimes (see list under § 3).

2. Process

IWAC commissioned Euromapping (see Terms of Reference, Appendix IV) to survey the sample waterways, essentially by interview, to obtain the relevant data. The work was conducted by Euromapping (inland waterways expert David Edwards-May) with contributions by The Canals Group in Canada and USA (State of New York).

A list of interviewees is given in Appendix I.

The list of subjects to be covered was complemented by the study team, thus giving the breakdown of contents for each waterway in the present report:

1. Brief description of the waterway, including history, identifying any particular liabilities or positive assets.
2. Key physical and management data, including governance structures and current costs, also historic costs where available.
3. Relative confidence, covering the political and economic perceptions of the waterway, also looking at future plans or proposals in respect of the waterway, current and any proposed new uses.
4. Funding and income sources and application of each to the waterway, including the proportion/percentage of each type of funding/income source within the total amount of income for the waterway or (where unavailable) for its navigation authority, possible improvements and new sources, and political/funding risks, also any changes to the current funding arrangements or to the proportion of different types of income sources, with the reasons for those changes.
5. Achievements/factors of success.
6. Future management challenges/projects.
7. Any other specific issues relevant to funding.

The advantages and disadvantages of the funding mechanism in each national context are analysed in chapter 12.

An indicator of the **relative funding and revenue profiles** of the waterways is also proposed, which involves characterising the extent of the infrastructure to be managed.

This does not account for the different capacities of the waterways, but makes their funding otherwise comparable by identifying their length in 'equivalent kilometres'.

For this purpose one kilometre is counted for each lock and movable bridge*. Also, 'natural edge' sections of waterways which run through lakes or reservoirs are counted at 1 km per 5 km length (i.e. 20% of the length of natural edge waterway). This allowance reflects costs which may be involved in signage or dredging on these open water sections. Under each section on management data, the cost and income per equivalent kilometre are indicated on this basis, and an overview of the results included in the summary chapter 12.

* Counting each movable bridge as a cost factor equivalent to a lock is justified by the greater mechanical complexity of bridge parts than of lock equipment, also the much greater wear and tear. This was highlighted by the case of the Drenthe waterways in the Netherlands, but also by the Roubaix and Espierres Canals in France and Belgium.

3. Overview

The waterways covered by the study are listed in the following table, with brief comments on the reasons for selecting them or their relevance to the question of funding.

Country	Waterway(s)	Basis of selection for analysis
Canada	Trent-Severn Waterway and the Rideau Canal	Two continuously operating heritage canals under the management of Parks Canada
Belgium/ France	Roubaix Canal – Espierres Canal (cross-border)	The French canal is the subject of ongoing negotiation and uncertainty as restoration nears completion. The Belgian canal continues to embody the historic approach to waterway infrastructure cared for by civil servants as a public utility
France	River Lot	Abandoned in 1926. Restoration started in 1988. Management by the three separate *départements* and two regions (Aquitaine and Midi-Pyrénées), as well as the *Entente de la Vallée du Lot* which brings together 6 *départements* and 4 regions.
France	Brittany (including Canal Nantes à Brest, Canal du Blavet, Canal d'Ille-et-Rance, la Vilaine, l'Erdre)	Transfer of ownership to the region in 2008, but with many issues left unresolved
Germany	Mecklenburg waterways (Müritz-Elbe Wassertraße, Müritz-Havel Wassertraße and connecting waterways), focusing on the example of the Finow Canal	The Federal Government (Ministry of Transport) is seeking to improve its understanding of the value of these former commercial waterways, with a view to handing them over to the region. The report focuses on the Finow as a canal managed with support from a grouping of local authorities
Germany	Smaller waterways in east Brandenburg (including the upper Dahme, upper Spree, Spree-Dahme Umflutkanal, Notte Kanal, Storkower Kanal and the Spreewald)	Example of a series of connected waterways for small craft, historically independent of the national system
Ireland	Shannon-Erne Waterway (cross-border)	Important example as the first major EU-funded restoration to be completed (in 1994)
Netherlands	Waterways of Drenthe province	This 'inland' province has a canal network under single management following transfer of the main waterway from the State to the Province in 1993. Many locks and bridges to manage, and the issues of new connections and cross-border inland waterways with Germany
Sweden	Göta Kanal	Example of a public corporation inherited from the original private canal company
USA	Erie and Champlain Canals	Example of tripartite negotiation and funding : Federal, State and public corporation

The question of funding and management of inland waterways is a critical issue everywhere, and not only in the current economic climate. The two terms are important, because in many cases central governments or regional authorities are concerned just as much with the governance as with the actual public cost of maintaining and operating the waterways. This is particularly true where transfer of ownership is currently envisaged, or has taken place without final settlement of all outstanding issues.

After analysis, several groups of waterways are in broadly similar situations, politically and financially. These situations represent varying scenarios, which may be considered as degrees of evolution from what we might term the 'default' situation , which is the historical situation of inland waterways maintained as transport infrastructure.

– early evolution to non-navigation functions,
– inherited State-owned systems, accepted as sustainable,
– State-owned systems to be transferred to regions,
– waterways already under regional ownership and/or management,
– waterways under a new 'mixed economy' management.

3.1 Early evolution to non-navigation functions

'Early' in this case means before the current trend of recreational and tourism development of smaller inland waterways. Under this category come part of the **Dahme-Spree** river and canal system (§ 7.2) and some of the canals inland from **Groningen** and **Meppel** (§ 9).

These waterways have historically been run by the equivalent of drainage boards in the UK, as serving essentially local needs, with the focus clearly on flow regulation functions. Navigation in the 'default' situation of these waterways is a peripheral function, since any freight movements that may still have been taking place in the first half of the 20th century would have been of marginal economic value and out of the public eye. In short, navigation fell off the agenda after World War II. Flow regulation meant that the waterways had to be maintained, and locks were also kept open for local movements, but navigation was tolerated rather than an objective of the management bodies.

An example today is the **Canal de la Basse Colme** in France, which was taken over by the local drainage board (Wateringues, 4th section) after commercial navigation ceased: now the Wateringues are not willing to enter into a tourism-based project which would impose constraints they have not had to deal with in 40 or 50 years.

One of the small canals ('Fliesse') in the Spreewald network in Germany: 1300 km in an area of 48 000 ha designated as a 'biosphere reserve' in 1991. These waterways are under Land *jurisidiction regarding environmental conservation, but they are actually managed by the* Kreis *or district council.*

The **River Lot** was also in this category of early evolution to non-navigation functions, in this case hydropower in plants large and small. Development since 1985 has taken the waterway clearly into the fourth category of 'regional' waterways, albeit in a precarious situation from the legal standpoint, since the works were authorised by the Ministry of the Environment on the understanding that navigation would be 'at the risk and peril' of the navigator.

3.2 Inherited State-owned systems, accepted as sustainable

Here the situation of central government control, whether through the transport or any other ministry, survives despite the possible investigation of alternative models or transfer to regional authorities.

In this category we find the Canadian canals, Sweden's Göta Canal (Ministry of Enterprise, Energy and Communications), the Waterways Ireland system (cross-border) and Belgium's Espierres Canal (extension of the Roubaix).

Flight of 8 locks at Ottawa on the Rideau Canal, Canada,

The **Canadian Canals** were transferred from the Department of Transport to Parks Canada in 1972. It may be argued that this is equivalent to regionalisation, since the activities of the national agency are organised with a large degree of independence in each province. However, they remain national heritage, and funding will continue to be secured on that basis.

The **Göta Canal**, which had been continuously in private ownership since it was built, was acquired by the State from the Wallenberg family in 1978. Transfer of ownership to the regions (or counties) has been envisaged, but only at a theoretical level and in an academic context (studies under the EU-funded Terra programme 'Voies d'eau Vivantes'). However informal the discussions during that programme, it is of interest to note the observation by researchers that different characteristics and agendas of the two counties concerned could lead to difficulties of coordination of policy, with possible consequences for the iconic character of the canal for Swedish tourism in general (see chapter 10).

Waterways Ireland, a North/South Body, took over responsibility for the navigable waterways in 1999 from the respective government departments in Northern Ireland and the Republic of Ireland. Their remit was to manage, maintain, restore and develop the inland navigable waterways principally for recreational purposes. This particular context implies stability at the national level, built into the agreement between the two governments.

The status of the **Espierres Canal** is complicated by the subtleties of Belgian regionalisation. Although the *Service Public Wallon* (SPW), formerly *Ministère de l'Équipement et des Transports* (MET) is a department of the Walloon Region, its functioning and decision-making are much closer to the central government model than any other. This transpires clearly from discussions with the authority in charge of the canal.

'National' status does not exclude the implementation of policies aimed at developing different uses, including recreation and the use of towpaths as cycle routes, etc, nor does it means that the future of any waterway is necessarily guaranteed. But it does mean that there are not the pressures associated with the policy of 'downgrading' and transferring from a central to a local authority. Direct and centralised management of the waterway system remains the obvious model in these situations.

3.3 State-owned systems to be transferred to regions

This is the most significant category for the purposes of the present study, precisely because of the radical changes that are now being envisaged or implemented. Despite the differences between the situations in France and Germany, the similarities on the key principles of funding and management are striking.

Grimonpont lift bridge on the Roubaix Canal, being opened for a France 3 TV film crew during a Press Conference on October 10, 2008. €50 million has been spent on the restoration, roughly half funded by the EU, but there is still no future owner or operator.

The **Canal de Roubaix** is to be transferred – in principle to the Region – in implementation of French Government policy, while the recreational waterways of **Eastern Germany** are also expected to be transferred to the regions (*Länder*).

The French conceding authority Voies Navigables de France (VNF) has joined the EU Interreg IVC partnership 'Waterways Forward' (work to be conducted in 2010-2012, if the project is approved), with a view to collecting precise economic data in support of the handover to the appropriate authorities. The Federal Ministry of Transport in Germany is also a keen observer of this work and hopes to benefit from the outputs.

It is of interest to characterise the stages in this devolutionary process:

a) Decision-makers (politicians and civil servants at ministerial level) feel that the historic model of management as State-owned transport infrastructure is no longer valid for recreational waterways which by essence support the tourism economy. This sector of economic activity is perceived as being a regional responsibility.

b) Transfer of ownership to an appropriate authority becomes a matter of Government Policy, and the intention is embodied in enabling legislation.

c) The regions see risks (both financial and in governance terms) in taking over what was previously State-owned infrastructure, without guarantees regarding the actual condition of the infrastructure, without the engineering, technical and management experience required and without the staff required. As a result, they refuse to take over, the liability weighing more heavily in the decision than the opportunity these waterways represent.

d) A new round of discussions is started, where both sides look to other possible partners. In France, the Region Nord–Pas de Calais remains insensitive to the appeals, while Lille District Council is moving to a position where

it might agree to take on the newly-restored canal, but only if the existing capability and resources within VNF are made available. The canal could then effectively be run as part of Lille District Parks. Nonetheless, Lille Métropole is still not committed, while the Ministry is not convinced that this is a viable solution, and is insisting that the future owner should be the region. In Germany, likewise, the Mecklenburg-Vorpommern Government has refused the takeover on the grounds that it has inadequate resources to fund such a commitment.

e) Hence a new approach in both countries. VNF is preparing the way for the future by putting together 'packages' which will then be easier for the regions to accept. It has already engaged discussions with private operators such as Vinci (car parks) and Club Méditerranée, with a view to Calls for Manifestations of Interest (AMI in French), a process prior to tendering, which could pave the way for public-private partnerships. What VNF consider to be an attractive package would consist of two elements: (a) a full financial and economic appraisal, showing what each waterway could generate, once the restrictions inherent in government control have been removed, and (b) a proposed deal with a prospective private-sector operator. The Ministry in Germany is similarly exploring the possibility of a public trust or foundation which could bring together the Federal, regional and municipal authorities.

Accordingly, the process remains to be completed in both countries.

3.4 Waterways already under regional ownership and/or management

These are waterways which may be considered as enjoying a more stable situation than those in the previous category, for having been brought under a regional or local level of administration, with a corresponding funding profile, before their development as recreational assets, or in the early days of the waterway tourism revival.

Hire boat on a lock-cut on the river Lot

Under this category we find some of the recreational waterways in Brandenburg and Mecklenburg-Vorpommern, the Brittany canals, the River Lot, the Drenthe canals and the New York State (Erie) Canal.

There are of course many differences, but the common feature of these waterways is that there is no major sea change on the horizon. The Central/Federal Government has already released its jurisdiction over these waterways many years ago (although the Erie was a New York State waterway from the start of its current building). National funding is sought for these waterways, just as EU funding is solicited for infrastructure works or other projects, but the 'Owner' of the works is irrevocably at the regional level.

In France, the issue of ownership is still to be resolved in legal terms, for the Government's policy implies a transition from the historical situation – long-term concession to the *départements* (equivalent to counties) – to full ownership, ostensibly under the Regions. Any such change inevitably becomes an occasion to negotiate, to seek to extract the best possible conditions, and it is not surprising that Brittany and the two regions covering the navigable river Lot (Aquitaine and Midi-Pyrenees) are hesitating to sign the takeover from the State.

The complex situations on the Lot and in Brittany are analysed in sections 5.2 and 5.3. But the fact remains that funding has historically been organised at the regional level, and this will continue to be the case.

The New York State Canal Corporation, which was created in 1992 as a subsidiary of the New York State Thruway, is in a slightly different category. Since the rebuilding of the waterway as the 'Barge Canal' in the early 20th century, it has been a regional ('State'-owned) asset, but responsibility was handed over to the Thruway, another category of State infrastructure. Although the Corporation remains public, the intention of the State was to secure long-term revenue to finance the canal from tolls collected on the Thruway. The objective was to run the waterway on a more commercial basis, the main drive being tourism and recreation. Control of management was thus removed from the State administration.

Much effort has gone into seeking a sustainable model for this expensive infrastructure, and the Erie Canal could have proven to be the most evolved example in this survey. However, despite a political climate which for 8 years or more has been favourable for privatisation or public-private partnerships, the canal is still, according to its director, in a critical situation regarding funding. This is explained in section 11.

3.5 Waterways under a new 'mixed economy' management?

It is perhaps tendentious to consider a 'mixed economy' or public-private partnership (PPP) model as being the most evolved. Indeed, there are cases where utilities have been bought back from the private sector by local councils, and there is a keen awareness in many countries that externalisation of public services is not intrinsically more sustainable than the conventional public regime.

It is nevertheless clearly an option, as shown by the example of VNF's current investigations described above under § 3.3.

It is also worth noting that a PPP is the chosen option for the design, construction and operation of the new **Seine-Nord Europe Canal**, for an investment of approximately **€4200 million**, to be funded 10% by the EU and 20% by tolls paid by users of the Seine-Scheldt Waterway. The EU's 10% contribution was confirmed in December 2008.

3.6 Relationship between legal structure and business model

Another preliminary observation which may be made is that there appears to be a close relationship between the waterways' legal structures and their business models. In reality, many State-owned waterways have never had a business model as such, being maintained as transport infrastructure in the public interest. This is typically the case in the Netherlands, Germany and Belgium.

Where the canals were built as investments by private companies, it has been easier to capitalise on the assets historically owned by these companies. This is typically the case in the UK and in Sweden; in Sweden, it is interesting to observe that 30 years after the Government's purchase of the Göta Canal from its private owners, the management is still applying the same toll structure for navigation, which the director now wants to make more accessible to boaters. The decline in toll revenue would be compensated by other sectors of the business.

This in turn raises the question of overall financial performance of each waterway. The report identifies the overall costs in relation to the extent of the infrastructure in equivalent kilometres (as defined in § 2 above). The comparability this offers is of course limited, since some waterways operate and maintain assets that are separate from the navigation infrastructure.

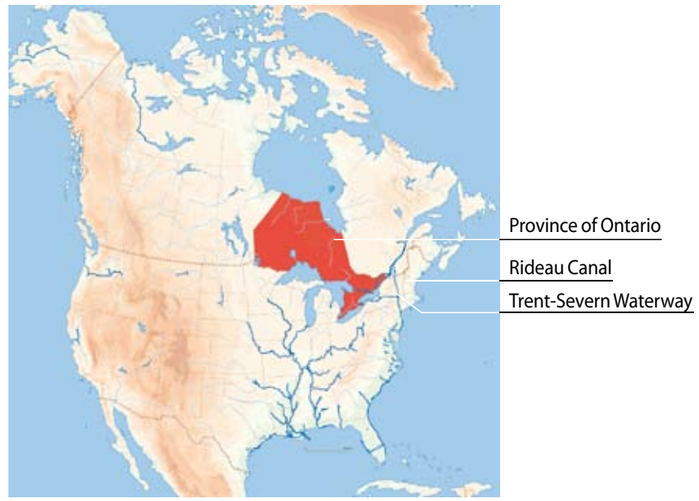
With the notable exception of the Göta Canal Company, most overseas waterways do not have property that can be readily developed. This means that they do not have to bear the capital and operating and maintenance costs associated with properties and marinas. It also means that they do not produce the corresponding income, which would be available for funding their core activity of maintaining the network.

Note

It must be underlined that the report reflects the situation of these inland waterways in March 2009, and that conditions are likely to change rapidly in the short term.

Within a few years, some quite substantial changes may be effected. These may correspond to the projections made in the report, but they may take different directions, depending on the policies of successive governments (central and regional) and the waterway authorities.

4. Canada



The Rideau Canal and Trent-Severn Waterway are examined to provide funding examples from two operating canals in Canada, both located in the populated south-eastern part of the vast Province of Ontario (see map). Although there are several similarities in the operation of these two canals, there are significant differences that lead them to be considered individually in this report.

Today the Rideau Canal and the Trent-Severn Waterway, designated as National Historic Sites of Canada, are managed by the Parks Canada Agency and overseen by the federal Minister of the Environment. Prime responsibilities of the canals are provision of through navigation, presentation and protection of their natural and cultural heritage.

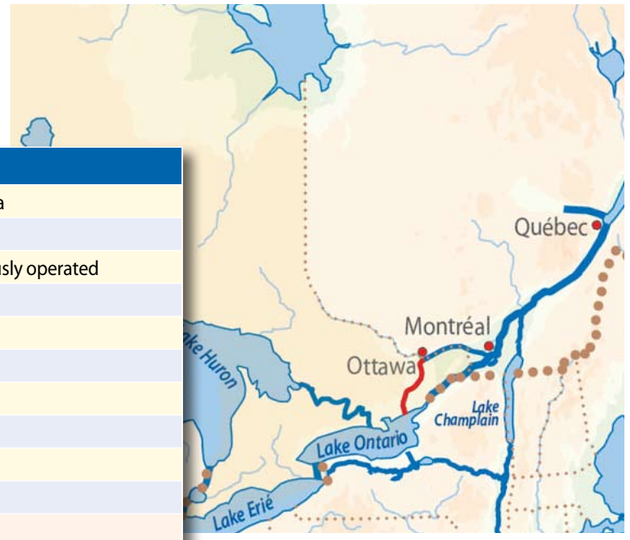
The Rideau was built from 1826 to 1832 for strategic military purposes. The Canal became a Canadian Heritage River in 2000, and in 2007 a World Heritage Site. In contrast, the Trent-Severn was built over some 85 years, opening for through navigation in 1920. It is one of North America's best examples of operating canal technology in the 19th and 20th centuries.

The current operating and maintenance functions of both canals are relatively stable although there are ongoing adjustments to internal reporting structures to better reflect programme emphasis and priorities. The management organisation is flat with the Superintendent of each canal reporting to the Chief Executive Officer of the Parks Canada Agency.

The nine operating national historic canals in Canada, managed by the Parks Canada Agency, operate with significant autonomy from each other. As the Rideau and Trent are the largest and are somewhat similar in their organisation and operation, they have an inordinate influence on historic canal policy and have a significant social and economic impact in their respective corridors and communities compared to the other seven operations.

4.1 Rideau Canal

(see Canada location map, p. 9)



Profile	
Ownership regime	Government of Canada
Management	Parks Canada agency
Built	1826 - 1832, continuously operated
Length of waterway	202 km
Number of locks	47 (at 24 lock stations)
Build cost	n/a
Recurrent costs	$ 6.6 M
Capital expenditure	$ 2.2 M
Operating revenue	$ 1.18 M
Percentage public subsidy	86.6 %
Sustainability of funding	high

4.1.1 Description and background

The Rideau Canal National Historic Site and World Heritage Site is under the responsibility and jurisdiction of the Parks Canada Agency, the federal government body responsible for national parks, historic sites and heritage canals.

The canal drains a watershed of approximately 4700 km². There are two cities on the canal, two towns and seven townships. The most recent 'Economic Impact Study of the Rideau Canal National Historic Site' indicated that the Rideau Canal itself contributes over $24 million to the national gross domestic product (GDP) and sustains over 600 full-time jobs. This does not include all of the other businesses that are located on or near the canal and also derive their business from the canal (i.e., rental boats, marinas and resorts).

The canal sits in a historic corridor with scenic rural landscapes, historic viewscapes and heritage towns and villages. This corridor contains some of the best examples of 19th century architecture in Ontario.

The Canal organisation has its headquarters in Smiths Falls. This office contains the Superintendent, Human Resources, Communications and External Relations, Engineering, Finance, Property Management and the Director of Operations. The Director of Operations is responsible for resource conservation, water management, visitor services and heritage presentation; the Director is situated in the same office along with the operations and maintenance function carried out through Sectors Managers who report directly to the Director of Operations. Also the Director of Operations has responsibility for the Canal's Main Shops.

4.1.2 Key physical and management data

Extent of the infrastructure		
Length (km)	202	Includes many lakes. The excavated canal sections represent only 19 km. The sections built by canalising the rivers amount to 114 km. The remaining 69 km are lakes.
Dimensions (m) Length Beam Air draught Draught	41.00 10.00 6.70 1.50	Boats regularly accepted for passage through the canal are limited to 27.40 by 7.90 m. Actual vessel dimensions to use a lock depend on hull and lock configuration (i.e. battered walls, dissipaters). Derogations may be solicited from the canal superintendant for larger vessels, although the maximum allowed dimensions are 37.80 by 9.10 m beam.
Number of locks	47	Distributed over 24 sites or 'lock stations'
Equivalent kilometres	187	Canals (19) and canalised rivers (114) + 20% of natural edge sections (14) + 24 lock stations x 1.5 (36) + 4 independent movable bridges

Management data (M Canadian dollars)			
	2005/06	2006/07	2007/08
COSTS			
Operating & maintenance costs (goods and services)	**1.6**	**1.7**	**1.7**
Salaries and wages (operating)	**4.9**	**5.0**	**4.9**
Total recurring costs (annual)	**6.5**	**6.7**	**6.6**
Capital projects	**4.9***	**2.0**	**2.2**
Total costs	**11.4**	**8.7**	**8.8**
Funding and income			
Operating revenue			
Entrance Fees	0.042	0.040	0.041
Camping Fees	0.007	0.007	0.010
Recreation Fees	0.515	0.510	0.602
Rentals & Concessions	0.206	0.330	0.273
Staff Housing	0.039	0.039	0.039
Other Revenue	0.067	0.057	0.086
Other	0.041	0.033	0.130
Total operating revenue	**0.92**	**1.02**	**1.18**
Funding			
Federal Government, through Parks Canada appropriation	**10.48**	**7.68**	**7.62**
Percentage public subsidy (% of total costs)	91.9%	88.3%	86.6%

* including an emergency funding allotment of over $4 million for Kingston Mills dam repair

The Parks Canada definitions of revenue sources are as follows:

- Entrance Fees – parking is charged per hour or day at a number of the popular lockstations,
- Camping Fees – users, i.e., canoeists, kayakers, small boats, cyclists and hikers,
- Recreation Fees – lockage, mooring, tours,
- Rents and Concessions – utility fees, land rents, office rents,
- Staff Housing – house rentals to staff and others,
- Other Revenue – business license fees, chart sales, publications, miscellaneous goods and services, cost recoverable,
- Other – internal administration, payments after the close of year, etc.

Per equivalent kilometre, the apparent cost is **$ 47 100** and revenue **$ 6 300**.

Management data (staffing)		
Personnel in the field* (2007/08)	98	full time equivalent
Personnel in office** (Sector)	6	
Personnel in head office*** (Canal)	48	
TOTAL	152	

* Field: all lock operators and maintenance staff, including lockmasters, and foremen

** Office: staff attached to Sector Office, Sector Manager and Finance/ Administrative Officer.

*** Headquarters: This is the main canal administrative office or headquarters including the central shops. The number is reduced to take account of the fact that some of the staff's time in the main or headquarters offices is devoted to servicing three other national historic sites and a national park in eastern Ontario. It is estimated that they spend approximately 70-80 % of their time on Canal responsibilities. For this exercise, the figure of 75 % is used to pro rata the amount of their person years (p.y.) devoted to the canal. The resulting number of p.y. is 29.33 x 75% = 22 per year.

Indicators of level of service	
Season operated	**Summer**: May 16 to October 15 inclusive (5 months) **Winter**: ice skating on the 7km urban section through Ottawa (without passage through locks)
Operating hours	High season, June 13 – Sept. 1 inclusive: 8:30 to 19:30 (every day) Low season, May 16 – June 12 incl. 08:30 – 16:30 h. (weekdays) 08:30 – 19:30 h. (Friday – Sunday and holidays) Sept. 2 – Sept.8 incl. 08:30 –16:30h. (everyday) Sept. 9 – Oct. 15 incl. 09:30 – 15:30 (Tuesday – Thursday) 08:30 - 16:30 (Friday – Sunday and holidays)
Locks	Service is on demand and at peak times of the navigation season there can be, on occasion, a waiting period at the busier or larger locks which could be up to one lockage.
Traffic	Recreational traffic only, av. 3000 per lock/year 1998 84 505 movements (a vessel is counted each time it passes through a lock) 2005 73 368 2006 69 804 2007 81 380
Transnational ?	Transit 950 boats/year 10-15% boaters from USA, 10% from Quebec
Land-based visits	1998 995 376 2005 1 350 661 (no figures for 2006/07, due to technical problems with the counting equipment)

4.1.3 Relative confidence

All interviewees are very confident in the future of the waterway. The issue is not whether there will be support, but what will be the needs in the long term and whether they can be met.

The availability of capital funding has increased over the past few years. However, there is a slow process of deterioration of the fabric and the integrity of the assets.

There is a new move to articulate dam safety, identifying needs, alleviating risks, and determining the level of funding required to carry out the works.

4.1.4 Funding

a) Amount and delivery of public funding

Government appropriations are distributed annually along with revenue, which makes up the difference between appropriations and expenditure. The base budget is based on traditional needs, and a five-year Business Plan outlines objectives and requirements.

Approximately 12% of the budget total (against a target of 10%) comes from revenue generated from all sources: user fees, land rents, land disposals.

Capital allocations are made on the basis of the needs of the long-term Capital Plan and the national funding capacity and priorities. Capital expenditures are based on long-term capital plans based on needs and prioritised against all the needs across Parks Canada and the availability of funds.

b) Decision-makers' relative understanding of the waterway's needs

In general, it is felt that politicians and administrators at the Federal level and in Parks Canada have a good understanding of the waterways and what they represent. However, this does not mean that all priorities are funded nor that funding is available to all cost centres.

c) Possible improvements

The ideas which have come forward are as follows:

– minimise bureaucracy,
– transfer management responsibilities of some elements – e.g. bridges and dams – to other agencies,
– give the management the flexibility to enter into broader partnerships and sponsorships,
– increase business lines that create additional revenue.

d) Political/funding risks

Stable funding does not address uncontrolled costs, i.e. inflation, union contracts, control of fees, or downturns in tourism revenues.

Furthermore, the Parks Canada programme has a large asset base and in turn high potential liabilities. This is an inherent risk, to which may be added the risks of changing government priorities, lack of appreciation for the economic impact the canal has on the communities, businesses and province, and a lack of direct link between economic impacts and the amount of funding provided.

The solution is twofold. On one hand, continue to monitor and identify asset requirements for funding with sound condition reports and implication information. On the other hand, continue to identify economic advantages and impacts to support sound financial requests for funds and decisions being taken.

4.1.5 Achievements/factors of success

The World Heritage Site designation has led to a broader awareness of the value of the canal: culturally, historically and as an economic generator. Increases to capital have enabled improvements to asset integrity and public safety.

Over the past years the waterway's outreach investment has resulted in a steady increase in stewardship awareness among both communities and the public.

4.1.6 Future management challenges/projects

With a rapidly urbanising society, there is an increasing trend of disassociation with the natural world, history and the attributes fostering national identity. The escalating costs of boating as a recreational activity is also affecting the level

of use of the canal. The challenge is to establish awareness and a sense of value of the canal and to work with others to generate awareness and use of the canal as a world-class tourism destination.

4.1.7 Specific issues

a) Waterway tourism

In the past the Canal and other tourism organisations worked on their own in tourism. However, the canal took the lead and brought together the many and fragmented tourism organisations along the canal corridor into an organisation called 'The Rideau Heritage Route'.

This has resulted in a much larger tourism organisation, more focused on the canal heritage corridor, with more impact per dollar spent. It has more influence as a broader-focused organisation when competing for tourism dollars and benefits from larger-scale advertising campaigns. As a group they pull together for the same markets instead of the earlier fragmented and competitive individual approach. With the two large cities on either end of the corridor that have the most dollars, it can be difficult to get them to the table and agree on an approach which works for all of the participants. However, this does not compromise nor diminish the positive and productive approach of an organisation working for and promoting the Rideau Corridor as one entity. This type of group depends on personalities to make it work and successful. The idea of a World Heritage Site brought everyone together and is now the common thread.

b) Water supply and flow management

There is some difficulty in maintaining navigation levels due to the lack of water in dry periods in the southern sector of the canal. When such a problem occurs, the Canal sets up a multidisciplinary team to look at the extent of the problem, review options and implement an agreement on any corrective action which may be required.

c) Staff Management

Managing a linear organisation spread out over 200 km with over 25 work locations, i.e., lock stations, sector offices/shops, headquarters and the main canal shop can be a challenge when trying to keep staff informed and feeling a key part of the organisation. Parks Canada and the Canal are presently going through reorganisation and changes which will impact on staff. This includes the canal going from three sectors to two sectors to help get a better workload balance and decision making amongst its management team. These types of changes create constant upheaval and uncertainty during this period.

The solution is to keep everyone informed, seek approvals for the changes and then implement them. It is very important to keep staff informed and up-to-date on the plans, changes and implications for them that are anticipated as early in the process as possible.

Conclusions on funding and income profile	
ADVANTAGES	*RISKS*
• The Federal Government is mandated to provide funding to maintain National Heritage sites	• Due to development pressures and other water requirements, the primacy of navigation is being questioned.

4.2 Trent-Severn Waterway

(see Canada location map, p. 9)

Profile	
Ownership regime	Government of Canada
Management	Parks Canada agency
Built	1835 - 1920, continuously operated
Length of waterway	394 km (+ 8 km Murray Canal)
Number of locks	44 (at 42 lock stations)
Build cost	n/a
Recurrent costs	Canadian $ 11.1 M
Capital expenditure	Canadian $ 7.8 M
Operating revenue	Canadian $ 2.84 M
Percentage public subsidy	85.0 %
Sustainability of funding	high

4.2.1 Description and background

The Trent-Severn Waterway is a connected system of lakes, rivers and canals that links Lake Ontario and Georgian Bay. Originally built for commercial and military purposes, it is now primarily an inland pleasure craft route.

The Trent-Severn Waterway has over 4500 km of shoreline and there are over 100 000 private properties adjacent to the waterway. The Waterway is also responsible for the administration of more than 8500 acres (3400 ha) of upland properties. Eighteen hydro-electric generating stations produce green energy and more than 35 species at risk live along its length. Much of the land immediately adjoining the waterway, and outside the heavily developed urban areas, has been developed for recreational use such as cottages, resorts and marinas. However, many areas remain in an undisturbed natural state.

Trent-Severn headquarters provides operations, engineering, real estate management, natural and historic resource management, communications and administrative functions. Operating and maintenance functions are carried out through three area organisations along the main navigation channel and a reservoir lake water management group. These units are responsible for the provision of navigation, water management and visitor facilities and report to a Director of Canal Operations in Waterway headquarters. Included in the responsibilities of the waterway is the operation of the nearby 8 km long Murray Canal. Its operation is integral to that of the Trent-Severn Waterway and is included in the budget figures presented.

4.2.2 Key physical and management data

Extent of the infrastructure		
Length (km)	**394 km**	Includes many lakes (152 km). The excavated canal sections represent 5 km, and canalised river sections 229 km. The total given here includes the 8 km length of the Murray Canal.
Dimensions (m) Length Beam Air draught Draught	25.60 7.00 6.70 1.80	The limiting length/beam for through passage given here is at Lock 45. Locks 1 through 18 measure 46.90 m by 9.70 m. Fifteen other locks measure 36.60 m by 9.70 m. Air draught is the minimum overhead fixed bridge clearance. The water draught is increased to 2.4m from Trenton (Lock 1) to Peterborough (No. 19).
Number of locks	**44**	Distributed over 42 sites or 'lock stations', including 2 hydraulic lift locks (boat lifts), and 1 marine railway. There are 12 swing bridges.
Equivalent kilometres	**317**	Canalised rivers (229) + 'pure canal' (5) + Murray Canal (8) + 20% of 'natural edge' (30) + 42 locks + 2 boat lifts + 1 marine railway

Management data (M Canadian dollars)			
	2005/06	2006/07	2007/08
COSTS			
Operating & maintenance costs (goods and services)	**1.7**	**2.1**	**2.0**
Salaries and wages (operating)	**8.3**	**8.5**	**9.1**
Total recurring costs (annual)	**10.0**	**10.6**	**11.1**
Capital projects	**8.2**	**7.6**	**7.8**
Total costs	**18.2**	**18.2**	**18.9**
FUNDING AND OPERATING REVENUE			
Operating revenue			
Entrance Fees	0.036	0.028	0.032
Camping Fees (for reference, negligible amounts, < $500)	-	-	-
Recreation Fees - lockage	0.730	0.788	0.865
Recreation Fees - moorings	0.193	0.184	0.236
Rentals & concessions - hydropower	0.598	1.940 *	0.885
Rentals & concessions - land rent	0.582	0.650	0.681
Staff Housing	0.010	0.011	0.011
Other Revenue	0.118	0.099	0.111
Other	0.016	0.026	0.019
Total operating revenue	**2.28**	**3.73**	**2.84**
Funding			
Federal Government, through Parks Canada appropriation	**15.92**	**14.47**	**16.06**
Percentage public subsidy	87.4%	79.5%	85.0%

* includes retroactive hydro revenue ($1.4M)

For the Parks Canada definitions of revenue sources, see under Rideau Canal, page 9.

Per equivalent kilometre, the apparent cost is **$ 59 600** and operating income **$ 9 000**.

It was noted that the operating and maintenance budget for the Waterway has changed very little over the last seven or eight years, with the exception of some funding for the dam safety initiative and small increases related to the signing of collective agreements.

Management data (staffing)		
Personnel in the field* (2007/08)	135.46	full time equivalent
Personnel in office** (Sector)	7.00	
Personnel in head office*** (Canal)	46.47	
TOTAL	189.93	

* Field: all lock operators, maintenance staff, reservoir/lake/dam operators

** Office (Area): staff attached to the Area Offices – Area Managers, Finance/Administration Officer

*** Head office: The main canal administration office including the Superintendent, Director of Operations, Engineering, Finance and Administration, Human Resources, Realty Services, Natural and Historic Resource Management, Water Management and Communications/Marketing

Indicators of level of service	
Season operated	**Summer**: mid-May to mid-October (5 months) **Winter**: Navigation closed
Operating hours	High season, June 20 - Sept. 1 inclusive: 8:30 to 19:30 (every day) Low season, May 16 - June 19 incl. 09:00 to 16:30 (weekdays) 09:00 to 19:30 (Friday – Sunday and holidays) Sept. 2 - Oct. 15 incl. 09:00 to 16:00 (weekdays) 09:00 - 18:00 (Saturday, Sunday and Thanksgiving Day)
Locks	Lockages are on boater demand. Wait time is generally minimal except at busy locks on weekends where there may be a one hour wait. This may be longer (2 hours) at Big Chute Marine Railway during busy periods. At each lock a visitor will find a minimum of two staff on duty during the high season. For locking through, there will always be two staff, even though there may be just one staff member at a station during the low season. Bridge stations have one staff member on duty.
Traffic	Recreational traffic only, av. 3500 per lock/year (15% more than the Rideau) 1998 180 279 movements (a vessel is counted each time it passes through a lock) 2005 160 612 2006 132 600 2007 146 696
Land-based visits	1998 1 471 883 2005 1 352 772 2006 1 340 324 2007 1 302 468

4.2.3 Relative confidence

The canal is seen as being of benefit to the public by a majority of Canadians. Public funding is therefore expected to continue. Even if the canal were to close, the water management responsibilities and infrastructure created by the canal would necessitate its survival. The current commitment to increasing the rehabilitation of deteriorating assets is expected to continue past the next five-year capital budgeting cycle.

It is also felt that the recent panel created by Parliament to review the future of the Trent-Severn Waterway (see §4.2.6 below) was positive and that following the election in October 2008, there would be an endorsement of many of the recommendations and a commitment to go forward.

However, the superintendent was cautious: it will be a challenge to overcome the deficit created by non-allowance for inflation over a large number of years, aggravated by the budget cuts in the 1990s, which greatly reduced funding and staffing for ongoing operations and maintenance. This deficit has affected the maintenance of assets that was needed in the short term. This has created increased deterioration of the assets and the need to spend additional funds. This might have been prevented or at least the life of the assets extended had funding levels prior to the cuts been maintained. It is also observed that the earlier reductions resulted in asset failures which led to closures and interruption of service to the public. It is feared that this may well continue for some time into the future, as testified by the current temporary closure of several bridges on the canal for repairs.

Staffing levels and elimination of programmes such as heritage presentation in the 1990s have limited what the canal can do in terms of engaging the public and offering of services. These restrictions still apply today, while the corresponding services are still expected to be delivered. This means bearing additional expenses, e.g. for some labour contract provisions and new or renewed initiatives such as visitor experience and heritage presentation.

4.2.4 Funding

a) Amount and delivery of public funding

The canal is primarily funded by appropriation from Parliament. Revenue generation is of prime importance and continues to be a management target: the objective is to meet at least 20% of the canal operations and maintenance budget by revenue from lockage and mooring fees, water rentals, licensing of real estate and hydroelectric rentals. It is currently around 19% (average over the 3 years considered), and it is thought that this can be increased primarily by pursuing hydroelectric development and new commercial development on waterway lands. This revenue can be applied to the operating and maintenance budget. As long as the basic budget remains constant, additional generated revenue may be used to commence addressing the shortage in staffing and the resumption of new initiatives in areas such as heritage presentation. Currently, the Trent-Severn Waterway has an annual budget shortfall of $1 million.

The waterway continues to be funded annually on the basis of the business plan and the integration of other planning exercises into the plan. The business plan is primarily developed using the Management Plan which has a 5-year focus and an asset management plan that has prioritised the rehabilitation of the Waterway assets over a 10-year period. The asset plan is primarily used to develop the capital budget.

The business plan is developed and submitted to the National Office. It is then rolled up into the Parks Canada business plan where funds are then allocated to Parks Canada by Parliament. The Superintendent subsequently signs a contract with the Chief Executive Officer of Parks Canada to carry out the business plan.

There has been increased focus on achievement of the objectives of the business plan. This has meant scoping the way the plan is carried out in the form of the 'State of the Parks' reports that ultimately go to Parliament. This creates additional work, but is a positive exercise in that it justifies the products delivered by the Waterway and the need to address the funding shortfalls.

It is felt that the business plan cycle of 3 years, the capital plan cycle of 5 years and the 5-year cycle of the management plan provide funding stability and are workable. The current commitment and approvals from the Treasury Board to provide additional funding to address the capital budget over the next 5 years is welcomed, and it is hoped that this will continue past the current period. The Board, following its own guidelines, has endorsed an increase in the capital budget to a level equal to 2% of the value of the assets. The additional funding increase of approximately $5 M per year over the existing capital fund (based on this 2% recapitalisation formula) would help the canal to maintain the assets at risk of potential failure.

b) Decision-makers' relative understanding of the waterway's needs

The Superintendent felt that there was an understanding of the need to fund the capital programme given the infusion of new capital dollars to the canal's base. This commitment is at the senior Parks Canada level and at the Treasury Board (parliament) level. However, there is a need to address deteriorating infrastructure at all levels of Parks Canada, the federal government and other levels of government. This could lead to less support or a need to cut the operating costs of the canal unless additional revenues can be tapped.

c) Possible improvements

In terms of optimising the existing budget, the Superintendent felt that there was a continuing need to streamline operations where possible and save dollars where appropriate. In this regard, he felt there was a need to revisit the hours of operation, look at closure of some less busy sections of the waterway during the shoulder seasons, and using one person per station particularly at mechanised stations. All these issues have impacts on staff and service and should not be looked at lightly. Other issues with such measures continue to be union resistance, boater discontent, Canada Labour Code issues, and resistance by the private sector which depends on the canal for business either directly or indirectly.

d) Political/funding risk

The Superintendent felt that one of the weaknesses on the canal is that it has been in a defensive position and many activities are not integrated with other jurisdictions. This he felt was partly due to lack of vision and partly to the lack of capacity to intervene.

Overall, there is still inadequate funding for maintenance of infrastructure. It is hoped that the recommendations of the Panel on the future of the waterway (see § 4.2.6) will help this situation

4.2.5 Achievements/factors of success

The resource conservation section has been successful in developing relationships with local groups and agencies as part of the species at risk initiative. It is also felt that current initiatives to integrate and network with local tourism and planning agencies provide hope for the future.

Key plans are in place to move forward. The canal has a management plan, a business plan and an asset management plan and is working on plans for the furthering of heritage and cultural resources. The process under business planning is integrating the plans and objectives of each individual plan more than ever. A positive factor is the requirement to scope all documents and report successes and failures through the 'state of the park' report. For the canal, the Superintendent felt that it has supported its continuance and need to operate.

4.2.6 Future management challenges/projects

The Superintendent felt that the canal's biggest challenge was to engage and network with local non-governmental organisations, agencies and governments in doing its day-to-day business. He felt the canal was a ribbon of relationships with others from one end to the other. The canal is potentially the portal to engage the urban community given the close proximity to the Greater Toronto Area.

Panel on the Future of the Trent-Severn Waterway*

The challenges in implementing the current management plan** lead to the realisation that the Trent-Severn Waterway is at a crossroads. Infrastructure deterioration, changing visitor patterns, the waterway's presence within a rapidly-growing highly populated area and commercial and industrial centre, competing demands for water, and the quality of the waterway's natural environment all offer challenges beyond the capacity of a single agency to manage. These challenges have been recognised as impeding the potential associated with the waterway. In October 2006, the Parliament of Canada unanimously passed a private member's motion that led the federal Minister of the Environment to create an independent panel to report on significant questions associated with the waterway's future. The report of this panel, completed in March 2008, was the result of some 30 public meetings and conversations with more than 1000 Canadians. Evaluation of the recommendations of the report is ongoing.

* Summarised from *Review of Other Models of Waterway, Waterway Corridor Management and Financing*, July 2007, The Canals Group.

** Drawn up in 2000 and scheduled for review in 2005/2006.

4.2.7 Specific issues

a) Waterway tourism

Navigation and flow management (dealt with in the following paragraph) are closely linked in the operation of the waterway. This is a positive factor. Dams at lock stations are operated by lock staff. The reservoir lake system is operated by dedicated Operations staff. However, declining boater use is a cause for concern. It is linked largely to uncontrollable factors of fuel price, economy, discretionary income of users and climate change effects.

The response of the management is to place more emphasis on the **total visitor experience**, from the point of view of both the customer and the organisation. The waterway has long been targeting land-based visitors as well as boaters, but now more emphasis is being placed on getting core messages to the land-based visitors. This is aimed as much at improving the experience for current visitors as increasing numbers.

b) Flow management

There are continuing conflicting priorities and competition for water. The panel report on the future of the Waterway proposed the creation of an independent water management agency. This drew attention to the water management system, and a vocal lobby in the reservoir lake system has resulted. The programme has been put under the microscope and in the media spotlight, with resulting pressure on the programme.

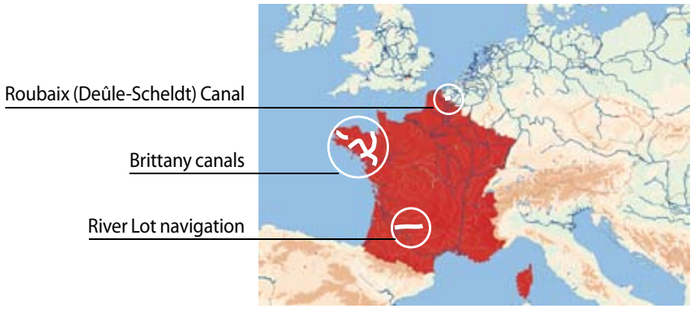
Staff are dealing with the situation and the pressures, increasing dialogue with other levels of government, within the government and with other agencies. It is hoped that satisfactory compromise solutions will be reached.

c) Political/funding Risks

There is still inadequate funding for maintenance of infrastructure. It is hoped that the recommendations of the Panel on the future of the Waterway will help this situation.

Conclusions on funding and income profile	
ADVANTAGES	*RISKS*
• The Federal Government is mandated to provide funding to maintain National Heritage sites	• Due to development pressures and other water requirements, the primacy of navigation is being questioned.

5. France



5.1 Roubaix Canal

The first example under France is a cross-border waterway involving Belgium, but the funding situation on both sides of the border is very different. Accordingly, the Belgian canal is dealt with briefly under a separate chapter (§ 6 hereafter).

Profile	
Ownership regime	State, Ministry of Public Works and Transport (in 1970), now VNF, transfer pending
Management	Voies Navigables de France in interim only
Built	1832-1877
Length of waterway	23 km (including branches)
Number of locks	13
Restoration cost (2009)	45 M€
Recurrent costs (1970)	1.25 M€
Capital expenditure (1970)	0.12 M€
Operating revenue (1970)	0.25 M€
Percentage public subsidy	81.8%
Sustainability of funding	impossible to assess in current situation

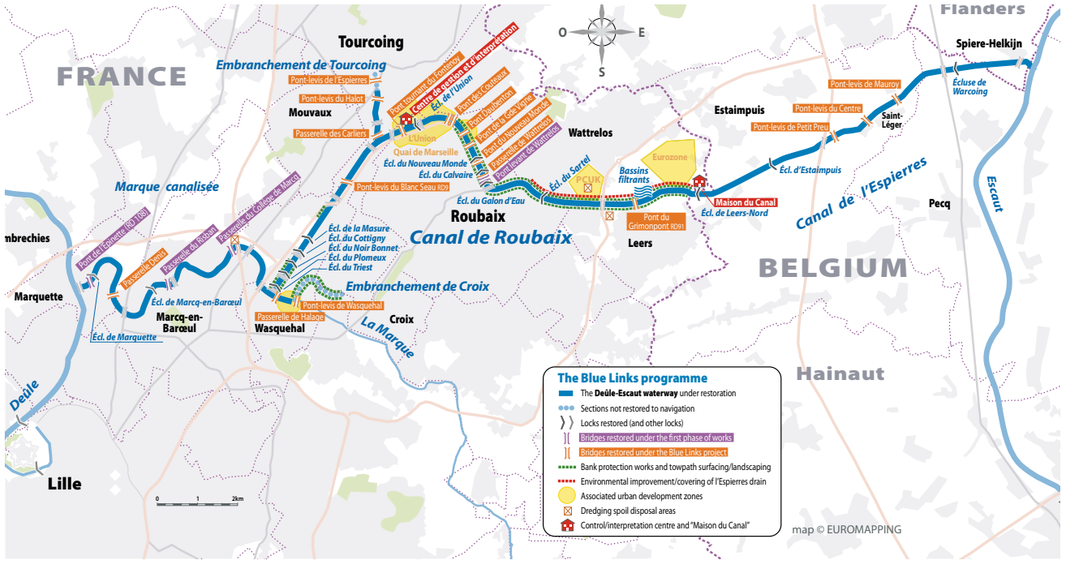
5.1.1 Description and background

The Roubaix Canal is part of the navigable link between France and Belgium, which was opened in 1877 after more than 40 years of works, and completed in 1893 by the branch to Tourcoing. This summit level canal, linking the Deûle to the Scheldt, stimulated or supported the growth of industry throughout the northern sector of the Lille metropolis, supplying the water and coal needed by the textile industry until the decline and eventual closure of all the weaving mills in the 1970s/80s. The management figures below reflect the operation of the canal in the 1970s (at current prices), before it was closed in 1985. The logic which prevailed at that time was that of transport infrastructure managed by the Ministry of Public Works as being of national interest.

Now the canal is about to be reopened, after works in two phases, 1999-2002 and 2005-2009, driven by Lille's plans for providing public parks, also by pressure from anglers and the transnational waterways movement, a significant role also being played by the EU's Interreg programme secretariat.

Future operation has to meet criteria, expectations and choices that are fundamentally different from those made under the pre-1980s 'industrial' regime, particularly from the financial standpoint. The earlier state nonetheless provides valuable baseline information and will assist in drawing up the future management plan.

The map below was drawn for communication purposes in the context of the current restoration. The canal infrastructure itself is the same as before, except for the two branches, which are both severed for navigation: the Tourcoing branch 300m before the end (leaving 1300m navigable) and the Croix branch 1900m before the end (leaving only 400m navigable).



5.1.2 Key physical and management data

Extent of the infrastructure			
Length (km)		**23**	including the 3 km of branches serving Tourcoing and Croix
Dimensions (m)	Length	38.50	The so-called 'Freycinet' standard, after Charles de Freycinet, Minister of Transport in 1877-79, for transporting loads of 250 tonnes at 1.80 m draught (before the introduction of motor barges, barges hauled from the towpath could load 280 tonnes at this draught)
	Beam	5.05	
	Air draught	3.70	
	Draught	1.80	
Number of locks		**13**	including one on the Croix branch
Equivalent kilometres		**44**	Main line (20) + branches (3) + locks (13) + movable bridges (8)

Management data (€ M)	
	1970
COSTS	
Operating & maintenance costs (goods and services)	**0.4**
Salaries and wages (operating)	**0.85**
Total recurring costs (annual)	**1.25**
Capital projects	**0.12**
Total costs	**1.37**
FUNDING AND OPERATING REVENUE	
Operating revenue	
Total operating revenue*	**0.25**
Funding	
Central government, through Ministry of Transport budget	**1.12**
Percentage public subsidy	81.8%

* 1953 Act established a toll to be paid by boatmen per tonne-km, to contribute to improvement and modernisation of the network, but the revenue was not assigned pro rata to the traffic carried by each section of the network. The amount here is indicative (250 000 x 20 km x € 0.05).

Per equivalent kilometre, the apparent cost is **€ 31 100** and revenue **€ 5 700**.

Management data (staffing)	
Personnel in the field	30
Personnel in office	7
Personnel in head office	1
TOTAL	38

5.1.3 Relative confidence

One would have expected the dynamic created by the current restoration to instil in all the partners a certain optimism regarding the future of the waterway. In reality, the project was perceived by many to be an extremely daring investment in a future change in perceptions of the area and resultant change in behaviour of the local population, including travellers, who have proved to be a threat to the structures themselves. Vandalism on the newly completed works was rife in the period 2007-2008.

The project's initiators took pains to underline the intrinsically vulnerable position of navigational structures that had been completed with modern technology but were not yet in use, but this was not sufficient to assuage the fears. Confidence was also difficult to instil since the canal's owner VNF was waiting to hand it over to a regional authority. The Government expected the Region to agree to ownership, but Nord-Pas de Calais Region refused to assume such a responsibility. This left *Lille Métropole Communauté Urbaine* (LMCU), the Lille Metropolitan Authority, as prospective owner almost by default. The authority's president, former minister Martine Aubry, wrote to VNF's regional director in February 2009, formally requesting an extension of the transitory arrangements under which VNF would not only maintain (which it was doing already) but also actually operate the waterway on completion of the restoration in July 2009. This was refused, but a commitment was made to assist in training LMCU staff.

Despite these shaky foundations, confidence increased during the build-up to the Blue Days event held on September 19-20, 2009, with 30 boats signed up to participate in the rally and flotilla cruises. Two weeks after the event, LMCU extended its areas of competence to include navigations and rivers in the public domain, thus legally enabling it to operate the canal with its own staff during the 2010 season.

This recent decision is remarkable considering the lack of enthusiasm of the Lille Metropolitan Parks Department. This body perceived the canal as a potential drain on organisational resources and budget, with relatively little boat traffic to justify it, especially in times of acute economic difficulties.

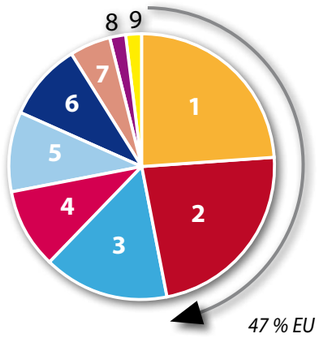
In short, Lille Metropolitan Authority was historically motivated by the towpaths, which it started investing in 15 years ago, and which correspond to a coherent metropolitan strategy, but saw navigation as an activity surrounded by uncertainty and difficulties, while VNF appeared to be careful with the information it made available to its local partners, presenting the infrastructure it was about to hand over in the most positive light. This care on presentation, perceived by the partners, tended to reinforce the doubts and apprehensions they harboured.

The partners made several visits to the UK to see examples of urban regeneration driven by canal restoration and associated development (e.g. Birmingham, Leeds, Manchester, Liverpool, Stalybridge and Banbury), but many still doubted whether the same mechanisms would be observed on the Roubaix Canal. Cultural, administrative and legal differences were put forward to suggest that this may not be the case.

5.1.4 Funding

The cost of the works implemented in the recent period was estimated by VNF and included in the package put together for EU funding. The figures in the following table correspond to the submission made in 2003 for the 'Phase 2' works which are being completed in 2009.

	Roubaix Canal and Espierres Canals (€ M)		%
1	EU – ERDF Objective 2	**9.04**	*24.0*
2	EU – Interreg III B	**8.63**	*23.0*
3	Lille Métropole Communauté Urbaine (LMCU)	**5.72**	*15.2*
4	Nord-Pas de Calais Region	**3.75**	*10.0*
5	Wallonia Region (Ministry of Public Works and Transport (MET, now SPW)	**3.56**	*9.5*
6	Artois-Picardie water board	**3.48**	*9.2*
7	Voies Navigables de France (VNF)	**1.91**	*5.1*
8	Conseil Général du Nord	**0.74**	*2.0*
9	National fund for solidarity in water sector	**0.76**	*2.0*
	TOTAL € M	**37.59**	*100.0*



The earlier works undertaken in France represented an investment of more than **€6 M**, including the Wattrelos hydraulic lift bridge, bank protection on the canalised river Marque and trails along the former towpath.

The most significant aspects of this funding package are the predominance of the EU share, here shown as **47%** (distributed between two programmes), the relatively low contribution of the local authorities – region and metropolitan area – covering just **25 %**, the use of Water Agency funding and a residual budget from a State fund for solidarity in water management (FNSE), together counting for more than **11 %**, and the very small contribution by the actual waterway authority, only **5%** (all these percentages to be corrected if the Belgian part of the package, representing 9.5 %, is isolated).

The low share of VNF is explained quite simply by the fact that the project is on a canal which was already **non-priority** for VNF in 2003, and which the Government now wants VNF to hand over to the regional/local authority.

Regarding annual operation and maintenance, the recent period has been characterised by the continued allocation of personnel to run the water supply system (pumping from the Deûle in Lille), and income from estates and fibre optics cable laid under the towpath. Revenue has thus amounted to almost a third of the costs, but this is not relevant to the future situation when the canal will be operated for navigation. Staffing in particular is a major concern.

5.1.5 Factors of success

Historically, one can qualify as a success story the ongoing maintenance and operation of the structure until its closure, and following that the continuous water supply (albeit of use to anglers only, and as a conservation measure). The restoration is itself a success, especially as infilling to make an urban expressway was planned as recently as 1991.

It is also to be noted that the communication and events programme run as an integral part of the 'Blue Links' restoration project succeeded in attracting goodwill and culminated in a highly successful boat rally and festival on the week-end of September 18-20, 2009. This generated substantial interest among regional and transnational boaters.

The project is a unique example of a spontaneous alliance between 'top-down' (the EU drive for the current restoration) and 'bottom-up' (anglers and boaters), while politicians and Council staff remained sceptical. A radical transformation of perceptions has thus been achieved.

5.1.6 Future difficulties or challenges

The challenges result from all the foregoing considerations.

- set up a sound and sustainable governance structure.
- adapt local planning and urban development to account for the reality of the canal and its functions, which essentially means building a basin as a focal point within the Union regeneration zone, bringing the canal's activity into the heart of the new quarter.
- manage and promote the waterway transnationally, in three languages (i.e. including Flemish), to attract a reasonable level of traffic distributed throughout the season, which should be made as long as possible.
- restore the branch through Wasquehal to Croix and Villeneuve d'Ascq (local councillors regret that this branch was excluded from the current restoration).
- implement works to put an end to overflowing of polluted stream flows into the Canal de l'Espierres in Belgium.

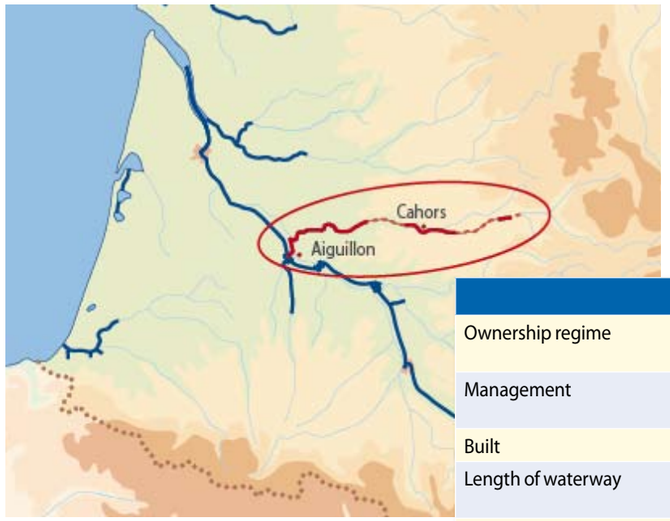
5.1.7 Specific issues

Water supply The original water supply system involved pumping through a 7 km pipeline. There were numerous incidents and breakdowns to manage. This was resolved by permanent attention by qualified and experienced personnel, applying solutions to meet all operating incidents. The new system is based on back-pumping at each lock and top-up supply from the waste water treatment plant through filter basins. This is reliable, but navigation will now have to accept the constraints of slight variations in the water level of each pound, and a drawdown during the day, compensated by the pumps operating during the night.

Staff management The canal remains labour-intensive. This constraint has to be accepted as such, and optimum staffing solutions identified for movable bridges in particular.

Conclusions on funding and income profile	
ADVANTAGES	*RISKS*
• The canal today has a minimum annual income from a licence for fibre optics cable under the towpath.	• No designated owner to take over from the State (through VNF) • Perception of canal infrastructure as being too costly to operate and maintain for limited use by boats • Vandalism • Perception of navigation as being a much lower priority than (for example) public transport at movable bridges

5.2 River Lot



Profile	
Ownership regime	State, concession to *départements* for works, transfer of ownership to region pending
Management	Operational department within the Council for each *département*
Built	1830 (second phase), abandoned 1926
Length of waterway	266 km (overall, including non-restored lengths)
Number of locks	33 restored to date
Build cost (restoration)	€ 75 M (to date)
Recurrent costs	€ 1.2 M
Capital expenditure	€ 1.2 M
Operating revenue	€ 0.1 M (paid directly to the Government)
Percentage public subsidy	100%
Sustainability of funding	high because of impact on local economy

5.2.1 Description and background

The Lot is one of the longest canalised rivers in France. Navigation extended over a distance of no less than 260km from the Garonne at Nicole (near Aiguillon) to the village of Livinhac, a few kilometres from the industrial centre of Decazeville. Open-cast mines here produced coal for steel works and other heavy industry throughout south-west France. The intense traffic thus generated was the reason for improving the navigation originally developed through to the early 19th century, and a new series of locks and weirs was built from 1830 onwards. At the same time the lock-cuts built to bypass the river's extravagant meanders at Luzech, Cajarc, Montbrun and Capdenac reduced the length of the waterway by 13km.

Like all the other river navigations in south-west France, the Lot was abandoned following the decline in commercial traffic due to railway competition. The river was removed from the list of navigable waterways in 1926. Legally it remains 'raftable.'

Its revival as a cruising waterway has been one of the most spectacular developments on French waterways since the tourism revival began in the 1970s. It owes a lot to Christian Bernad, deputy mayor of Decazeville, who founded the *Association pour l'Aménagement Touristique de la Vallée du Lot* in 1969. A formal management and coordinating body, the *Entente Interdépartementale du Bassin du Lot*, was established in 1980, bringing together the five *départements* covering the river's catchment area: Lozère, Cantal, Aveyron, Lot and Lot-et-Garonne.

After a feasibility study (by the author) in 1986, a first 64km length of the river was restored in 1990, from Luzech to Crégols. This section, centred on the town of Cahors, became highly successful as a cruising holiday destination, despite some difficulties due to the river's capricious flow regime. It also attracted many land-based visitors to the otherwise neglected river.

The three *départements* through which the waterway runs accordingly agreed to seek funding for complete restoration, and the remarkably ambitious comprehensive restoration project was approved by the Entente, thanks to the inclusion of road improvements and tourism infrastructure in the 'non-navigable' *départements*, then by the French Government in 1992, with an overall investment budget of around **€140 million**.

Each *département* remains responsible for maintaining and operating its own section, and this has unfortunately proved to be an obstacle to the collection of data for the annual costs on each section. The Entente hoped to be able to obtain the data for which we solicited the engineers in charge in Lot and Lot-et-Garonne *départements*, but there appears to be an unwillingness to cooperate even with their own 'holding' or coordinating body.

This suggests a structural weakness which is covered in § 5.2.6 below.

5.2.2 Key physical and management data

Extent of the infrastructure		
Length (km)	**179** 266	current total of the four navigable sections total length on completion of the programme adopted by the *Entente* in 1992. The map highlights the lengths already opened to navigation and those remaining to be restored.
Dimensions (metres) Length Beam Air draught Draught	30.50 5.05 4.40 1.00	 3.50m in Lot-et-Garonne the available draught is 1.50m in Lot-et-Garonne and 1.20m in Aveyron
Number of locks	**33** ~58	current number of locks on the navigable sections (7 in Lot-et-Garonne, 23 in Lot, 3 in Aveyron) final number depends on technical options for the last dams to be bypassed, at Cajarc, Montbrun and Luzech
Equivalent kilometres	**191**	The total for the currently navigable sections (179 + 33 locks) would be 212 equivalent kilometres, and the final total approximately 324 (by addition of the figures in light blue), depending on possible engineering options for the critical unrestored sections. For the management section, the Aveyron length is deducted (no figures available, since operation has not yet started); this leaves 163 km and 28 locks, i.e. 191 equivalent kilometres.

Management data (€ M)			
COSTS	2007	2006	2007
Operating & maintenance costs (goods and services)	**n/a**	**n/a**	**0.24**
Salaries and wages (operating)	**n/a**	**n/a**	**0.96**
Total recurring costs (annual)			**1.20**
Capital projects	**n/a**	**n/a**	**1.20**
Total costs			**2.40**
FUNDING AND OPERATING REVENUE			
Operating revenue			
Total operating revenue (estimation for reference only, directly to the State and not available to the waterway management)	**0.1**	**0.1**	**0.1**
Funding			
Councils of the two *départements*			**2.40**
Percentage public subsidy (currently)	100%	100%	100%

Per equivalent kilometre, the apparent cost is **€ 5 700** and operating income approximately **€ 470** (although as indicated, this is not paid into the account of the councils which actually maintain and operate the waterway).

Management data (staffing)		
Personnel in the field	12	Lot has a team of 6* Lot-et-Garonne has a team of 6* Aveyron: none assigned to date
Personnel in office	~4	
Personnel in head office	not applicable	
TOTAL	~16	

* including 2 permanent lock-keepers, one at each of the large new locks (Castelmoron and Villeneuve)

Indicators of level of service	
Season operated	generally 1st April to end October (15th November in Lot *département*), but often shortened by high levels and currents incompatible with navigation in hire boats
Operating hours	9:00 - 19:00 in Lot-et-Garonne *département* 8:00 - 20:00 in Lot *département*
Locks	permanent lock-keepers at the large new locks only, otherwise self-operated
Traffic	maximum between Vers and Saint-Géry, up to 2800 boats per year through the busiest locks, minimum at Nicole lock (connection with Garonne), less than 150 boats/year (cf. § 5.2.6)
Personnel in field	minimal (maintenance teams on call in case of incident)
Training in tourist services	negligible

5.2.3 Relative confidence

The Entente is confident in the future of the waterway, at least for the sections already restored in Lot and Lot-et-Garonne, where the councils will continue to fund annual operating and maintenance costs.

The situation in the Aveyron is more open to doubt, since the restored length, with one new lock and two restored locks, is 18 km long, which is insufficient to support significant boating activity. Despite completion of the works, the waterway has not officially been opened to navigation.

On the river Lot overall, there is long-term confidence built into the State funding agreement, but with termination of the above-mentioned State-Region development fund granted in 1992, it is now a constant struggle to secure the actual budgets for ongoing investment in the remaining non-navigable sections.

5.2.4 Funding

Investment

Until 2006, the *Entente* partners had secured Government support based on the following funding shares: State/Europe (former Objective 2 zone) 60 % and Region 15 %. This left 25 % to be financed by the Project Authority or Owner (*Conseils généraux* or *syndicat mixte*).

In Lot-et-Garonne, for example, in the period 1992-2008, the average annual investment has been € 1.2 M (on the Lot, Baïse and Garonne link), and on average roughly € 0.6 M for the river Lot itself. Over the 17-year period, that represents a total investment on the Lot of around € 40 M (of which € 10.2 funded by the *département*).

Now that the State-Region development planning contracts have been terminated and replaced by project-specific contracts, it is no longer possible to proceed with this level of support. The new interregional agreement for the Lot Valley (‘*Plan Lot*’) for 2007-2013 had to be signed without appending a corresponding funding programme. It is also to be noted that the EU, which had systematically supported the Lot Valley project for 30 years, has categorically refused to provide any further financial support.*

This leaves the State and the Regions. The latter agreed to increase their share by a third, bringing it up to 20 % of each new tranche of investment. The *départements* are also prepared to increase their share from 25 to 30 %. Central government is therefore being asked to continue to finance the remaining 50 %.

Today, in the absence of a long-term investment programme, it is necessary to make a new subsidy application each year. It is the individual project authorities which have to draw up their investment programme based on hypothetical central Government subsidy levels. As a result, the projects are on a smaller scale than previously, typically involving one or two locks in each *département*. These projects are presented by the respective councils with a view to making lesser demands on State funding (between €3 and 5 M, representing a maximum of 50 % of the cost).

The applications are put together by the project authorities, and the *Entente* is then responsible for making the submissions for funding to the Ministry of Regional Development (*Aménagement du territoire*). It is also at the level of the Entente that the high-level negotiations take place.

The strength of the project stems largely from the existence of this body which has been representing the five *départements* for nearly 30 years, effectively maintaining a common front, along with the two main regions, to continually promote and lobby for the project, transcending political differences.

The complex processes leading to delivery of State funding for the investments involve the following intermediaries:

- at the level of each *département*, the central government representative (*Préfet*),
- at the interregional level, the coordinating regional representative (*Préfet* of the Midi-Pyrénées Region),
- at the national level the interministerial committee for regional development and competitivity (CIACT) and the minister in charge of regional development.

The interregional agreement for the planning period 2007-2013 sets out the justification and procedures for the ongoing restoration works, for a projected total of **€64 M** over this period. As indicated above, the French Government has committed to contributing **€9 M** for economic accompanying measures (moorings, new boat harbour, new hotel/*gîte* accommodation and tourism promotion).

It is to be noted that the river Lot is today the only inland waterway in France to benefit from a specific investment programme supported by central government.

* By comparison, the first restoration programmes in the period 1981-1993 benefited from EU funding under the Programme Intégré Méditerranéen (PIM), from a total EU envelope of €36.6 million which covered agriculture, tourism, water resources and environmental works. About 15% of this amount was spent on funding 75% of the first restored length of 64 km.

Operation and maintenance

The budgets for operation and maintenance are accepted by the Council of each *département*, as expenditure on infrastructure considered essential for development of tourism and the tertiary sector. The river is a relatively low-maintenance waterway thanks to the low level of staffing and do-it-yourself locks, thanks also to the 20th century hydropower schemes which made long lengths of the river navigable without requiring lockage or bank maintenance.

Operating income

The small income shown in the table is currently paid to the State through the public works agencies for each *département*. The payments are annual rent for occupation of the waterway estate, particularly for boat harbours. It is to be noted that these sums are not transferred to the accounts of the Councils which carried out the restoration works. Discussions are under way with a view to transferring ownership of the waterway from the State to the Regions or *départements*. Only when this process has been completed will the historic rental agreements be taken over, resulting in a small income to the new owner for these uses of the waterway estate.

5.2.5 Factors of success

Restoration of the river Lot is without doubt a success. Forty years after lobbying began for the project, it is still a major reference in terms of regional development (*aménagement du territoire*), and although it is increasingly difficult to obtain funding for the ongoing restoration, the *Entente* has nevertheless obtained (for the planning period 2007-2013) specific State funding of **€9 M** for economic accompanying measures (moorings, new boat harbour, new hotel/*gîte* accommodation and tourism promotion).

It is a success also through the wide-ranging knock-on effects which may now be observed. Recreational navigation (essentially hire boats and trip boats) is estimated as producing local spending of **€14 M** per year, while water sports in the catchment area – covering canoeing and angling – produce an annual economic impact estimated at **€8 M**. The riparian communes have gradually become aware of the importance of the river as a vector of development, water quality is taken into consideration, politicians are increasingly sensitive to this aspect and the river Lot is much cleaner than in the past. Villages are no longer turning their backs on the river, but are working hard to exploit its potential by landscaping the banks, laying out new footpaths, and a variety of other initiatives.

One of the key factors of this success is the personal implication, investment and lobbying by the leading personalities. As in the UK, this is in the first place a history of individuals who stood up in the face of widespread cynicism (and in some cases large-scale industrial opposition) and campaigned for their project. The role of Christian Bernad, founder of the *Association pour l'Aménagement de la Vallée du Lot* in 1969, has already been mentioned. A key to the overall project, requiring large structures at the hydropower dams, was the agreement reached in 1991 between Jean François-Poncet (former Minister of Foreign Affairs, at that time President of the Lot-et-Garonne Council and of the Entente) and Maurice Faure, twice minister under François Mitterrand, then President of the Lot Council. The project was thus fortunate in being promoted and by personalities who were leading political figures of that period, in a position to influence decision-makers each within their own *département*, and both in the corridors of central Government in Paris. They became passionate about the project because the studies they were presented with showed what a major impact it could have throughout the valley.

Success was also won by carefully weaving into the navigation restoration project a comprehensive local development package covering all water-related activities, a coherent tourism development strategy throughout the catchment area and environmental improvements, including qualitative and quantitative management of the water resources.

Management of **flood flows** was the subject of long negotiations with the *Electricité de France* (EdF), owner of the vast hydropower schemes in the upstream catchment area, with a view to at least attenuating the surges due to peak power production during the operating season. These surges were highly detrimental to the hire boat industry, since they effectively stopped navigation at regular intervals, particularly during the spring.

Management of **low flows** was the subject of an agreement signed in March 2007*, with a positive impacts for the

* Source www.valleedulot.com/programme/PGE/PGE-Lot_PROTOCOLE.pdf

future of the waterway, since it specifically takes into account the value of the navigation function, both on the historically canalised reaches of the river and through the reservoirs impounded by the hydropower dams. This is an important result, for there have been cases in Southern France where the agricultural lobby has forced closure of inland waterways, perceived as a threat to irrigation water resources. The lower Lot valley has 20 000 hectares of irrigated farmland.

5.2.6 Future difficulties or challenges

The main challenge for the future is to secure the funding of the last sections to be restored: the lock bypassing Fumel dam, the final sections in the Lot *département* (with Luzech dam downstream and Cajarc and Montbrun dams upstream), and completion of the section in the Aveyron.

These works are now formally designated as a 'possible third phase' of restoration, i.e. to be programmed after the current period 2007-2013, if the impacts measured at that time are sufficient to justify the much higher levels of investment which will then be required. A particular difficulty will be justifying new canalisation works in the former loops of the river, which returned to a semi-natural state after the bypasses with their tunnels were built in the second half of the 19th century.

Finally, it remains to secure the link across the Garonne to the river Baïse, hence the Garonne lateral and Midi canals. The passage across the marly sill upstream of the Lot confluence is impossible for long periods of low flows during the operating season.

These physical obstacles are reflected in the institutions involved in governance, which look after the separate sections of the waterway independently of each other, and even to some extent in competition with each other. Once funding of the initial investment has been secured thanks to the political lobbying and administrative work performed by the Entente, it is then up to each *département* to manage the assets as it sees fit. This situation is undeniably a weakness in the governance of the navigable river Lot as an entity.

From the marketing and communication standpoint, it remains to forge the identity of the Lot Valley as a tourist destination in its own right, both at the national level and internationally.

Conclusions on funding and income profile

ADVANTAGES	*RISKS*
• Each *département* manages the funding of its length of the waterway at its discretion, according to its tourism development strategy • The *Entente* ensures effective lobbying at the national and European level, and common marketing; substantial EU and State funding was thus secured • The indirect economic impacts of restoration to navigation have been well researched and are perceptible to all the population, hence support overall for expenditure from local taxes	• EU funding no longer available for ongoing investments • Investments remaining to be completed for full restoration judged prohibitively expensive and environmentally unsound • Conflict between requirements of inland navigation and peak hydropower production • Disparate management criteria and methods • Limited resources available to the *Entente* as coordinating body • Lack of transparency in management of navigation and unwillingness of engineers in each *département* to supply data

5.3 Brittany canals

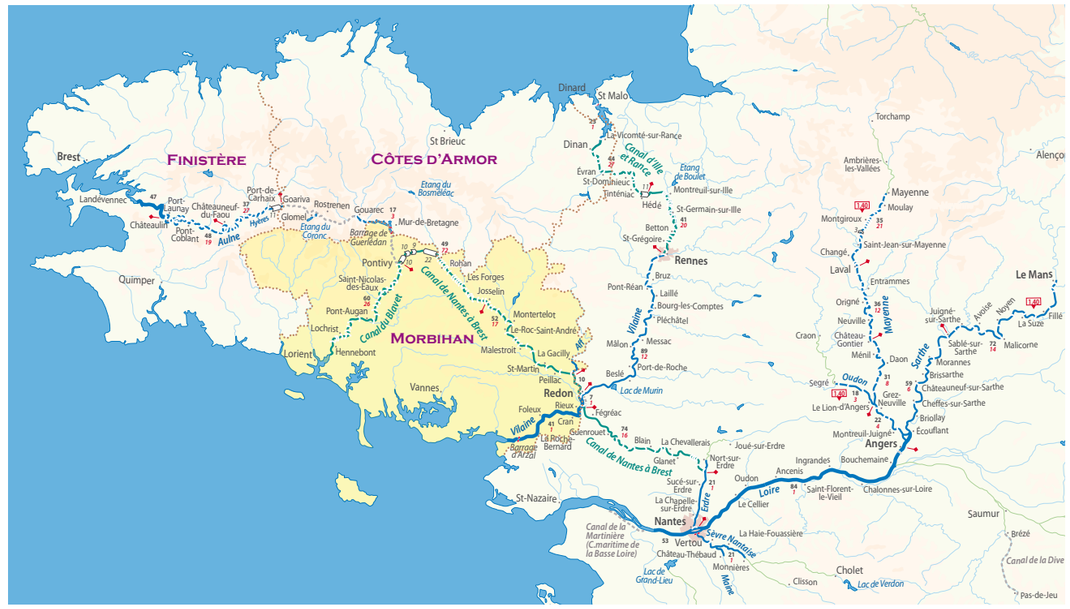
Profile	
Ownership regime (example of Morbihan)	Transfer from State to Region completed in theory, but remains to be legally enacted
Management	the Morbihan *département* Council, directly
Built	1804 - 1842
Length of waterway	240 km
Number of locks	130
Build cost	n/a
Recurrent costs	€ 3.25 M
Capital expenditure	€ 1.9 M
Operating revenue	€ 0.2 M
Percentage public subsidy	96.1%
Sustainability of funding	uncertain - under examination

5.3.1 Description and background

The **Canal de Nantes à Brest** was built between 1804 and 1842 to secure supplies to Brest in case of a blockade of Brittany's ports by the British Navy. This was a gigantic project, crossing three watersheds, using 8 rivers, and requiring no less than 236 locks over its total length of 360 km. Its decline set in when the railways were opened through the region, and accelerated irremediably when the Guerlédan dam and hydroelectric power plant were opened in 1926, thus isolating the Finistère part of the route. The **Canal d'Ille-et-Rance** (48 locks, 84 km) was developed between 1565 and 1802 to provide a navigable route from Rennes to Saint-Malo; the river Vilaine was also canalised, thus completing the inland route from the English Channel to the Atlantic (*liaison Manche-Océan*). The canalised river **Blavet** (60km), built in 1802-1825, connects the Nantes-Brest route to the Atlantic seaboard at Lorient, through 28 locks.

The Brittany Canals Committee was founded in the late 1950s to campaign for conservation of these waterways, since the threat of closure was very real at that time. It is still very active today, and has played a significant role in lobbying politicians and preventing potentially catastrophic measures from being implemented.

The entire network was transferred to the Brittany Region in 2008. This will eventually complete the decentralisation process begun almost half a century earlier, when the canals were conceded to the *départements*. However, it remains to ratify the transfer, which means a further phase of negotiations between the State and the Region to determine the precise limits and condition of the estate that is transferred. This chapter focuses on the network managed by the Morbihan Council (cf. map on next page).



5.3.2 Key physical and management data

The situation of inland waterways in Brittany is complex, both politically and economically.

Management of this waterway network (like that of the Anjou rivers to the east) has evolved gradually since the State began to pull out in the early 1960s. The legal context at that time precluded wholesale transfer of ownership, and the regional level of local government did not yet exist. The obvious scenario for continued operation of the waterways was the 'concessionary' regime, which placed the four *départements* in the front line for funding and management. (Loire-Atlantique in what is now the Pays de la Loire region has only a relatively small length of this network, and is excluded from this analysis, to focus on the one region.)

Accordingly, there are now five different management bodies.

The **Institution pour l'Aménagement de la Vilaine** (IAV) was founded in 1961. It was as much a river basin agency and water authority as a navigation authority. Its profile and statutes are those of an *Établissement Public Territorial de Bassin* (EPTB), which under French law has a broad range of activities under the overall heading of river basin management, carried out on behalf of the local authorities they represent. The three main domains are flow management (low flows, prevention of flooding and production of potable water), the environment (actions in favour of migrating fish species, maintenance of banks, environmental monitoring) and local development (actions in favour of the natural and cultural heritage). The area covered may be the river corridor or its complete catchment area, and generally concerns at least two *départements*, often different regions.

The **Syndicat Mixte d'Aménagement Touristique de l'Aulne et de l'Hyères** (SMATAH) was founded in 1973. This brings together the Finistère *département* and the 22 riparian communes.

The Institution de gestion du canal d'Ille et Rance, involving the two *départements* Ille-et-Vilaine and Morbihan was founded in 1979. It changed its statutes and became the **Institution du Canal d'Ille-et-Rance Manche Océan Nord** (ICIRMON) in 1990.

This left most of the Canal de Nantes à Brest and the canalised river Blavet without a specific management body. The public works authority (*Direction Départementale de l'Équipement*) for each *département* operates its sections directly, covered by concessionary agreements which were initially signed between the Government and each Council (*Conseil Général*).

The region was established as the first level of local government under the Decentralisation Act of 1983, and from that date it became the objective of the French Government to hand over planning responsibility to the region. This led to an overall concession of all Brittany's waterways to the Region in 1989.

From that date, there were four different levels of management more or less directly involved: the State, through its staff in the public works authorities, the Region – its role limited to planning, coordination and promotion, the three institutions (cf. details of contacts in Appendix I), and the two *départements,* Morbihan and Côtes d'Armor.

Now ownership of the entire network has been transferred to the Region, which means that the *départements* have become concessionaries from the Region instead of the State.

The following data covers the canals under the responsibility of the Morbihan *département* (*Conseil Général*), which are representative of the Brittany canals where they are **most challenging**. The Morbihan network, with the Canal de Nantes à Brest (heavily locked summit level section and the canalised river Oust), the canalised river Blavet and the abandoned length of the canal to Guerlédan, followed by the Guerlédan reservoir and the section of canal beyond that into the Côtes d'Armor *département*, effectively cover all the issues currently facing the Region as owner and principal funder, while offering the advantage of 'historic' unified management over the entire length concerned, in the hands of the public works agency (*Direction Départementale de l'Équipement*).

Extent of the infrastructure (Morbihan *département*)		
Length (km)	**240**	of which 20 km not currently in operation, from Pontivy to Guerlédan
Dimensions (m) Length	25.70	
Beam	4.60	
Air draught	3.15	
Draught	1.10	
Number of locks	**130**	of which 11 not currently in operation, on the section from Pontivy to Guerlédan
Equivalent km	**339**	not counting the section currently abandoned, i.e. 220 km + 119 locks

Management data (€ M)			
	2006	2007	2008
COSTS			
Operating & maintenance costs (goods and services)	**1.1**	**1.1**	**1.1**
Salaries and wages (operating)	**2.15**	**2.15**	**2.15**
Total recurring costs (annual)	**3.25**	**3.25**	**3.25**
Capital projects	**1.6**	**1.7**	**1.9**
Total costs	**4.85**	**4.95**	**5.15**
FUNDING AND OPERATING REVENUE			
Operating revenue			
Total operating revenue	**0.2**	**0.2**	**0.2**
Funding			
Region	**4.65**	**4.75**	**4.95**
Percentage public subsidy	95.9%	96.0%	96.1%

Per equivalent kilometre, the apparent cost is **€ 15 200** and operating income **€ 590**.

Management data (staffing)	
Personnel in the field (2007/08)	76
Personnel in office	10
TOTAL	86

5.3.3 Relative confidence

There is concern for the future, not because it is feared that the Region may abandon its canals, but because of the implications of transfer of ownership from the State to the Region. The level of confidence varies according to the institution considered and the characteristics of its part of the network.

The ICIRMON is confident that the sea-to-sea route will remain navigable in the long term, since it is a long-established tourist asset and essential to the region.

The SMATAH has recently had to face two major difficulties: flood damage to the weirs and locks in the mid-1990s, then again in 2006, and the vigorous campaign to prevent the rivers Aulne and Hyères from being classified as Heavily Modified Water Bodies under the terms of the EU Water Framework Directive. Some environmentalists and anglers hoped to block this designation and then promote a return to free-flow conditions, which would have implied the demolition of all the weirs. Confidence was dented by these events, and is also limited by the fact that the waterway is isolated from the rest of the network.

The IAV enjoys the same benefits as the ICIRMON, of being on the main sea-to-sea route, with the additional advantage of attracting sailing boats throughout the river from the Arzal dam up to the yacht harbour at Redon.

The Canal de Nantes à Brest and the canalised river Blavet do not have the complication of an additional level of administration between the Region and the *départements*, but many other difficulties and complications:

- the interruption at Guerlédan dam, a critical factor which is the subject of constant lobbying by the Committee,
- the pressure from environmental groups and angling federations, to 'decanalise' the canal between Guerlédan and Pontivy, to complement the provision of fish-passes at the 28 weirs on the Blavet,
- the very large number of locks on the canal,
- the complex intertwining of the canal and the border between the *départements* Côtes d'Armor and Morbihan.

As a result, the interviewee for Morbihan was not able to indicate a degree of confidence. He observes that the canals are a subject which people throughout the network are passionate about, and engineers and technicians find this both fascinating and challenging. Specifically, the integrity of the Morbihan canals depends on the outcome of a study in progress, looking at the detailed implications of decanalisation of the canal from Pontivy to Guerlédan.

5.3.4 Funding

Transfer to the Region took place in January 2008, but since January 2009 a completely new scenario has applied, because the State has transferred to the Region all the civil servants that were previously paid out of the Ministry of Sustainable Development budget (transport department).

The French Government has granted a 'reprieve', by undertaking to pay salaries for one more year (i.e. 2009). Despite this, the Regional Council has filed an appeal against the terms of the transfer. It refuses to commit to paying for more than 200 civil servants, where the three institutions themselves employ less than 100.

There is very little funding from the EU. It covers only one-off operations involving peripheral measures, not capital works, with the exception of a major programme of repairs after major flooding in 2000-2001, where a total of **€20 M** was funded 40% by the State, 20% by the EU, 20% by the Region and 20% by the *départements*.

The French Government's participation has been substantial, through the cost of the State employees maintained through the years, as indicated above.

For capital works, the general rule has been 75 % funding from the Region. The rest of the investment is shared by the *départements* involved.

In the case of the ICIRMON, the shares are calculated as follows:

Côtes d'Armor	15 %
Ille-et-Vilaine	85 %

(This is roughly pro rata the 'equivalent kilometre' length in each *département*, i.e. allowing 1 km per lock.)

5.3.5 Factors of success

This waterway network is considered by the vast majority of the population to be an essential element of the regional landscape and an asset for balanced economic development throughout the region, especially its inland areas, historically underprivileged in tourism promotion. Brittany's canals are now essentially part of the region's heritage, as structures of great architectural and historic value, as well as being environmental and tourist assets.

Brittany is one of the most popular regions in France for waterway cruising in hire boats.

The canals are also now established as a destination for long-distance cycling and walking holidays. According to one interviewee in the Morbihan *département*, this activity alone justifies maintaining the canals in fully navigable condition, because the tourists come precisely to see the canal and its structures actually working, and boats passing.

Within the Regional Council, responsibility for the waterways has now (in January 2009) been transferred from the Department of Tourism to the Department of Development and Local Territorial Policies. This is also perceived to be a very positive move.

5.3.6 Future difficulties or challenges

The main concern from the standpoint of the **Brittany Canals Committee*** is to make sure that the inland waterways serve as the reference framework for coherent development of tourism in Brittany hinterland.

The waterways have been spared the erratic and in some cases questionable development of the Region's coastline. The Committee claims to be the only organisation which has thorough knowledge of the network, kilometre by kilometre, thanks to its members distributed throughout the region. It therefore feels it has a legitimate role as a 'federator' of interests working for regional development, in close collaboration with the various stakeholders along the waterways.

The flooding in recent years has highlighted the problems which arise in the absence of coordinated management of catchment areas. The same observation may be made in all areas, according to the Committee: protection of landscapes, treatment of urban interface, water quality, signage, materials for making lock-gates, etc. The lack of a region-wide framework in all these areas prompted the Committee to draw up a list of proposals designed to promote more strategic thinking among all concerned: local elected representatives, the *départements*, the regional council and the ministries concerned.

The Committee proposes reservation of a grassy strip 50 m wide on the off side (opposite the towpath) of the entire length of the Canal de Nantes à Brest, the construction of boat harbours and moorings, obligatory installation of sewage holding tanks in boats, small-scale hydropower plants on the river Aulne for electricity supply to boats at long-term moorings,…. It is also recommending protection of sightlines from the waterways, restrictions on building on the immediate waterside, statutory requirements for landscaping treatment to ensure better integration of new buildings in the landscape, and a policy for maintenance of canalside trees in coordination with the national forestry commission (*Office National des Forêts*).

The new strategy for wide-ranging promotion of the Brittany canals also includes the creation of a 'Viking Boat' label, designed to be attributed to seagoing craft whose characteristics make them compatible with river and canal cruising, i.e. with the canals' limited navigable dimensions. This label would be defined with the boat builders.

The Committee believes the region's interests would also be served by eliminating the need for a boat driving licence for all boats with a maximum speed of less than 15 km/h and length less than 15 m.

* Comité des canaux bretons et voies navigables de l'Ouest

The aim is to promote circular cruises combining coastal 'hopping' with inland transits, including passage through a marine railway to bypass the Guerlédan dam, or even a boat lift inspired by the Falkirk Wheel in Scotland.

(a) Organisation

For all the managers at the level of the *départements* or the three existing institutions, the short-term challenge is to define an efficient organisational structure taking account of the transfer of ownership to the Region, and the transfer of responsibility within the region from the Department of Tourism to the Department of Development and Local Territorial Policies.

(b) Maintain the status of heavily modified water bodies

The second major challenge is to avert the risk of irreversible designation of the Pontivy-Guerlédan canal as free-flowing water. This should be possible, since the first indications are that this scenario produces a whole series of undesirable impacts, such as threatening the foundations of bridges, lowering the water table, reducing the extent of wetland habitats and affecting potable water supplies.

The battle has not yet been won, however, and advocates of the 'return to nature' can point to the limited impact of navigation as such on what would remain a little-used branch unless Guerlédan were to be by-passed by a lift. There have to be strong economic arguments for maintaining the status of heavily modified water bodies.

(c) Restore the complete network

The third challenge will be to by-pass the Guerlédan dam and complete restoration of the summit level section of the Canal de Nantes à Brest between Mellionec and Goariva at the border between Côtes d'Armor and Finistère.

The question was discussed at a conference in Josselin on September 3-4, 2008, where the question of integration within the European inland waterway network was on the agenda.

Conclusions on funding and income profile

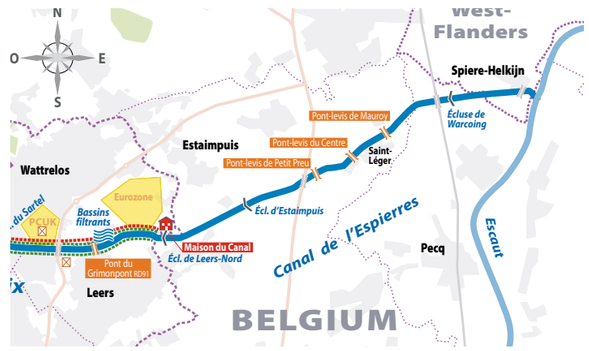
ADVANTAGES	*RISKS*
• Transfer of ownership from the State to the Region places strategic development in the hands of a single authority with full powers to intervene and ensure equitable funding over the entire network	• No clear definition of the assets and liabilities of the network (subject of a study to be conducted in 2009) • Transfer not formally completed until Region has analysed the results of this study and made a possible submission to the Government for arrangements and compensation (e.g. regarding personnel) • Disparate local management bodies with different statutes • No licensing or other income from boats or boat hire firms

6. Belgium - Canal de l'Espierres

Profile	
Ownership regime (1970)	State
Management	Ministry of Communications
Built	1840 - 1843
Length of waterway	8.4 km
Number of locks	3 (+ 3 lift bridges)
Build cost (restoration 2009)	5 M€
Recurrent costs (1970)	0.28 M€
Capital expenditure	0.1 M€
Operating revenue	0.008 M€
Percentage public subsidy	97.4%
Sustainability of funding	high, Wallonia Regional Government

6.1 Description and background

The canal de l'Espierres is situated in Belgium between the French border and the Scheldt. It passes through the provinces of Hainaut and West Flanders. It was built in 3 years (1840-43) to complete the Deûle-Escaut link, thus extending the Canal de Roubaix. For more than 100 years, the canal contributed to economic growth of the region, allowing economic coal supplies to industry in Lille, Roubaix and Tourcoing. It was operated by the *Service du Borinage* in Mons, before being transferred to the Waterways Management in Tournai.



Its role was exclusively commercial until the waterway closed in 1985. The economy and management of the canal cannot be isolated from the context of the waterway network run by what was then the Ministry of Communications. The data hereafter is indicative (in current values).

6.2 Key physical and management data

Extent of the infrastructure		
Length (km)	**8.4**	
Dimensions (metres) Length Beam Air draught Draught	38.60 5.20 4.00 1.80	The draught indicated applied to the commercial waterway until closure in 1985. As now restored, it will have a draught limited to 1.60 m.
Number of locks	**3**	There are also 3 lift bridges.
Equivalent km	**14**	8.4 km + 3 locks + 3 lift-bridges

Management data (€ M)	
	1970
COSTS	
Operating & maintenance costs (goods and services)	**0.1**
Salaries and wages (operating)	**0.18**
Total recurring costs (annual)	**0.28**
Capital projects	**0.1**
Total costs	**0.38**
FUNDING AND OPERATING REVENUE	
Operating revenue	
Total operating revenue	**0.008**
Funding	
Central Government, through the Ministry of Communications budget	**0.37**
Percentage public subsidy	97.9%

Per equivalent kilometre, the apparent cost is **€ 27 100** and revenue **€ 570**.

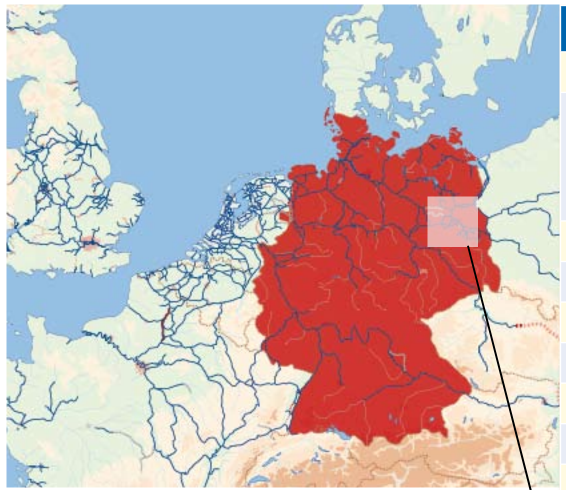
Management data (staffing)	
Personnel in the field	8
Personnel in office	3
Pro rata personnel head office	-
TOTAL	11

6.3 Relative confidence

The transition from State to Region was effective when the two Regions (plus the capital region of Brussels) were created. However, Wallonia's Ministry of Public Services (Department of Waterways and Mobility) still functions with the characteristics of a State organisation. Regionalisation in Belgium cannot be compared to the regionalisation currently under way in France.

Conclusions on funding and income profile	
ADVANTAGES	*RISKS*
• Integrated management of mixed-use waterways as transport infrastructure is part of core strategies of both Wallonia and Flanders; both are proactive in including smaller recreational waterways	• Espierres Canal is peripheral • Lower priority than Wallonia's high-capacity waterways (e.g. for dredging) • Minister has been reluctant to approve works

7. Germany



Area of Brandenburg waterways shown in map below

Profile	
Ownership regime	mixed, Federal and Regional (*Länder*)
Management	East German Waterway Authority (Wasser- und Schifffahrtsverwaltung Ost) Ministry of Infrastructure and Spatial Development (for the two *Länder*)
Built	(canals) from early 17th century
Length of waterway	627
Number of locks	~40 and ~10 moving bridges
Annual running costs	€ 21.4 M
Annual capital expenditure	€ 17.1 M
Operating revenue	€ 0.2 M
Percentage public subsidy	99.5 %
Sustainability of funding	open to question in the current situation

The waterways of former East Germany cover the regions (*Länder*) Mecklenburg-Vorpommern and Brandenburg and the capital region of Berlin. Most of the network (in blue on the map below) remains under Federal control. Branches (in green) are under the jurisdiction of the *Länder*, since they were never incorporated into the East German commercial waterway network. The Spreewald 'biosphere' canal network is also under regional ownership, but management is in the hands of the local district council (*Kreis*). The situation is complicated by the fact that many of the Federal waterways, no longer of commercial value, are expected to be handed over to the *Länder.*

The principles of this handover and the various impacts on funding and possible income are currently being discussed, but no clear direction has yet been identified. We look in this chapter at overall funding considerations, then the specific cases of the Finow Canal and the Spree-Dahme waterway system.

7.1 Funding overall

The waterways in former East Germany fall into three categories as indicated in the introduction:
- the Federal waterways which have been enlarged since the late 19th century for modern transport requirements,
- the secondary, smaller-capacity Federal waterways which have long been abandoned by commercial traffic,
- the secondary recreational waterways which have always been under regional (*Land*) ownership.

The waterways in the first category form a network 1827 km long. Those in the second category, all within the same interconnected network, total 627 km. The historically regional waterways amount to a further 555 km in the sample *Land* of Brandenburg. This figure increases to nearly 2000 km if all the waterways navigable by small unpowered craft are included.

The following tables present the overall figures for the two categories of waterway under **Federal administration**.

Overall funding data for Federal waterways in Eastern Germany (€ M)	2005	2006	2007
Commercial waterways (classes III to VI) - 1807 km			
Operating & maintenance costs, goods and services	**22.3**	**24.5**	**23.6**
Operating & maintenance costs, salaries and wages	**52.3**	**52.7**	**52.6**
Salaries and wages (administration)	**22.0**	**22.4**	**21.9**
Total recurring costs (annual)	**96.6**	**99.6**	**98.1**
Capital projects	**155.2**	**126.4**	**153.1**
Total costs for commercial waterways	**251.8**	**226.0**	**251.2**
Recreational waterways (classes 0 to II) - 627 km			
Operating & maintenance costs, goods and services	**6.2**	**5.4**	**5.8**
Operating & maintenance costs, salaries and wages	**11.2**	**11.7**	**11.1**
Salaries and wages (administration)	**4.8**	**4.6**	**4.5**
Total recurring costs (annual)	**22.2**	**21.7**	**21.4**
Capital projects	**13.5**	**15.0**	**17.1**
Total costs for recreational waterways	**35.7**	**36.7**	**38.5**
Income overall on waterways of Eastern Germany			
Federal Ministry of Transport budget allocation to Eastern Germany	**287.4**	**263.4**	**289.7**
Lump sum annual payment by boating and water sports federations (share for Eastern Germany)	**0.2**	**0.2**	**0.2**
Total funding (Federal budget and income)	**287.6**	**262.6**	**289.9**
Percentage public subsidy	100	100	100

This table highlights the characteristic dichotomy of a national waterway authority in Europe. The high-capacity waterways represent the bulk of Government expenditure (here 87 to 88 %), but decision-makers and auditors looking at the core responsibilities of a national transport infrastructure provider may justifiably look at the other 12 to 13% as being 'diverted' from their main projects and their essential function of delivering the maximum 'transport potential'. It is therefore likely that a significant change will be made in the coming years, similar to that now being made in France, whereby the smaller Federal waterways will be transferred to the regions.

Two factors militate in favour of this change. The first, as in France, is the concern of the Federal Government (Ministry of Transport and Construction) that the recreational waterways fall outside its remit, and should therefore be transferred to the *Länder*. The second is the widespread awareness of the value of the smaller waterways as integrated and interconnected regional cruising destinations, both for cruising holidays in hire boats and for touring and camping in small open boats and canoes. There are also substantial numbers of private boats and especially houseboats. Waterway tourism thus plays a major role both on the Müritz-Elde system in Mecklenburg-Vorpommern and on the Dahme-Spree system in Brandenburg.

Another detail in the table, of fundamental importance, is the income from recreational uses. The amount is negligible, but the principles it embodies will determine the future funding profile of the recreational waterways. Following the UK and French examples, there have been moves for many years to obtain some payment by recreational users for use of the waterways. Faced with the risk of losing a historic privilege, the national lobby formed by the boating and water sports federations has to date resisted attempts to charge individual boats, proposing instead to pay a lump-sum annual fee on behalf of all their members. The lump sums thus transferred to the Ministry are then shared among the regional waterway authorities; the share paid to the waterway administration for Eastern Germany is €200 000.

The debate is still open on both the above subjects – transfer to the *Länder* and the introduction of boat licensing – and no progress will be made pending the General Election in September 2009. It should be noted that this is not a party political issue: there are politicians promoting and resisting the change in all parties.

7.2 The case of the Finow Kanal

7.2.1 Description and background

The Finow Canal is one of the oldest in Germany. It was first built between 1605 and 1620 with 20 locks. It was practically destroyed in the Thirty Years War (1618-1648) then rebuilt in 1743-1746. It has 12 locks, over a total length of 41.3 km. It was one of the most heavily used waterways in the world, with annual traffic amounting to 3 million tonnes. Between 1906 and 1914 the new Havel-Oder Canal was built, running parallel to the Finow. Traffic thereafter used the new canal, designed for larger barges (up to 700 tonnes). A 32 km section of the old canal comprising 12 locks remained practically intact until the mid-1990s. However, the traffic became marginal, so that the second lock chambers were gradually infilled or in one instance rebuilt as a bypass weir for surplus flow. The canal still carried minimal freight traffic until 1973. It then began to be used exclusively by boat traffic, and even that was sporadic. All navigation ceased in 1992, following a major failure at one of the locks (cf. Roubaix Canal in France). Other locks and weirs also fell into disrepair, and the canal started to silt up.

The **Association for the Preservation of the Historic Finow Canal** campaigned for restoration of the canal from June 1995, and its objective was fulfilled in 1999 when the canal was reopened to navigation. Many additional improvement works and dredging have been carried out since then. Overall, this has been a highly successful project, attracting considerable numbers of boaters in all categories and land-based visitors on the towpaths.

7.2.2 Key physical and management data

Extent of the infrastructure		
Length (km)	**32**	The currently restored length. Restoration of a further length, the Lange Trödel, is projected.
Dimensions (metres) Length	42.60	
Beam	4.60	
Air draught	3.80	
Draught	1.00	
Number of locks	**12**	
Equivalent km	**44**	32 km + 12 locks

Management data (€ M)			
	2005	2006	2007
COSTS			
Operating & maintenance costs (goods and services)	**0.44**	**0.50**	**0.47**
Operating & maintenance costs (salaries and wages)	**1.82**	**1.83**	**1.84**
Salaries and wages (administration)	**0.62**	**0.63**	**0.62**
Salaries and wages (hired personnel for season) (special employment scheme)	**0.13**	**0.11**	**0.10**
Total recurring costs (annual)	**3.01**	**3.07**	**3.03**
Capital projects	**0.48**	**2.09**	**4.33**
Total costs	**3.49**	**5.16**	**7.36**
FUNDING AND OPERATING REVENUE			
Operating revenue			
Total operating revenue (boating and water sports federations)	**0.02**	**0.02**	**0.02**
Funding			
Federal transport budget allocated to regional waterways	**3.34**	**5.03**	**7.24**
Part-time salaries funded by employment scheme and local authorities	**0.13**	**0.11**	**0.10**
Total funding and earned income	**3.49**	**5.16**	**7.36**
Percentage public subsidy	100	100	100

Taking the figures for 2005, excluding the exceptional investment programme in 2006 and 2007, the apparent cost per equivalent kilometre is **€ 79 300**. The income is negligible, as explained under § 7.1.

Management data (staffing)	
Personnel in the field	15
Personnel in office	4
Pro rata personnel head office	1
TOTAL	20

Indicators of level of service	
Season operated	1st May to 30 September
Operating hours	High season : 9:00 to 17:00, without having to announce passage
Locks	Lock-keepers present (by arrangement with the local authority grouping)
Traffic	(in 2008) 4300 rowing boats and canoes 6300 motor boats

7.2.3 Relative confidence

The enormous success of the canal and its events programme inspire a high level of confidence. The large number of unpowered craft also makes the canal more popular than if it were only used by powered craft.

The interviewees believe that the current institutional uncertainties will be resolved. For the local authority grouping, it may be more convenient to deal with the *Land* than with the Ministry of Transport.

7.2.4 Funding

The restoration project was promoted locally, but ownership remains with the Federal Government, which was solicited for approval of the works and for a contribution to the cost. Ministerial approval was obtained from Bonn in June 1997 covering 75 % of the projected cost of **€21.5 M**, while Brandenburg Government financed the remaining 25%.

This Government investment in a non-commercial waterway may seem contradictory with the policy move towards abandonment of State ownership. The explanation lies in the non-navigational functions of the canal, which is in reality the canalised river Finow. Guaranteeing flood flows through the canal is of importance for the connecting commercial waterways. On this basis, the works were approved under the Federal waterways budget.

The Finow Kanal local authority association was founded in 1996. It was one of the first such groupings in Brandenburg under the enabling Act of the Federal parliament. The shares are proportional to the population. The town of Eberswalde (population 33 000) accounts for two thirds of the total population represented.

Complementary funding comes *de facto* from this association, under a cooperation agreement in force since 2003, whereby workers (originally 16, now 11) are made available to the Eberswalde waterway office, to supply tourist information to boaters on the canal, at the same time working the locks. These workers are funded by the Federal Employment Authority and the regional Employment Agency for Brandenburg. They are posted at 8 of the 12 locks, which have to be worked manually. These arrangements were necessary to ensure regular operation of the waterway during the season, since the Eberswalde office was unable to man the waterway with its own resources.

7.2.5 Factors of success

Success in Brandenburg is essentially a function of the awareness and commitment of local authorities, as prime beneficiaries of the economic impacts of waterway tourism in all its forms.

Proof of this commitment, and the success on which it is founded, lies in the Waterways Tourism Initiative (WIN) in Northern Brandenburg, which local authorities set up in 2004. This brings together three district councils and the municipal councils of Neuruppin, Oranienburg, Eberswalde and Templin. Their objective is to form a coherent interconnected network of 345 km of cruising waterways. In particular, the plans involve restoration of old canals around Oranienburg : the 'Langer Trödel' and the Werbellin Canal, which would be connected to the Finow Canal. The Brandenburg regional government is also involved. The initiative is aimed specifically at promoting the growth in the hire boat industry : an environmentally sustainable growth in the supply of hire boats in the region, new hire bases, marinas, moorings and camping places for open boats, along with improved hotel and guest house accommodation. The intention is to develop the whole range of waterway tourism activities from canoeing and rowing through cruising in motor boats to trips in passenger vessels.

Events are a key factor in securing widespread public support for the Finow Canal

The accompanying illustration of a traditional log raft, in the context of one of the Finow's annual events, is evidence of how the canal is appropriated by the local population. There is a full programme of events throughout the season, and heavy traffic in unpowered craft, some continuing beyond the season when structures are manned (hence portaging at the locks).

7.2.6 Future difficulties or challenges

The Brandenburg region (as well as the neighbouring region of Mecklenburg-Vorpommern) is currently envisaging setting up a trust (cf. The Waterways Trust in the UK), in which the Federal Government would take part financially, for 50% of the cost, while the other 50% would be contributed by the *Land* with all the local council groupings and individual councils concerned. A delegation visited the UK in 2008 to meet The Waterways Trust, to explore this new funding and management model.

However, as indicated above, no progress is expected to be made until after the September 2009 General Election.

7.3 The Spreewald 'biosphere reserve' canals

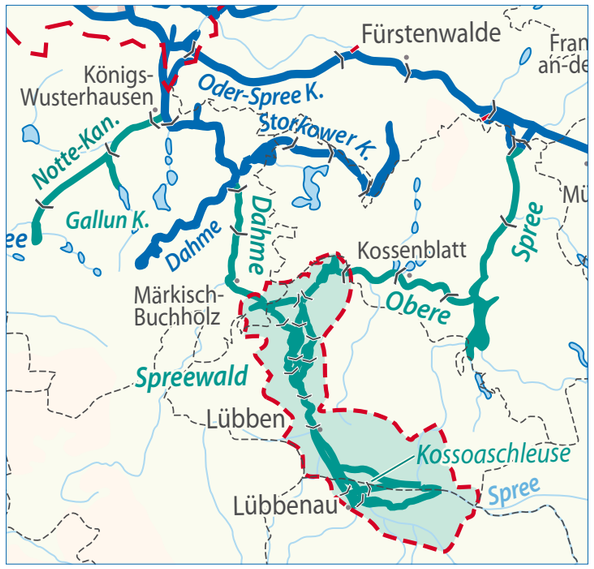
7.3.1 Description and background

Surface waters including 3000 lakes are an essential feature of the Brandenburg landscape, and the funding and management model covers them overall, without separating the three different categories of navigability: fully navigable, canoeable or inaccessible to all boats. The Brandenburg tourism marketing body gives the extent of the network as 1600 km of waterways navigable by motor craft and a further 6000 km canoeable.

The Spreewald network comprises 1300 km in an area of 48 000 ha designated as a 'biosphere reserve' in 1991. (More than a quarter of the land area of Brandenburg is a protected biotope.) These waterways are under *Land* jurisdiction, depending on the Ministry of Regional Development, the Environment and Consumer Protection. Management is devolved to the '*Kreis*' or district council. In all, Brandenburg has 26 *Gewässerunterhaltungsverbände or* local water management bodies, pursuing similar policies and following the same set of procedures for regional funding.

Accountability of each local managing body to the *Land* and of the *Land* to its population therefore covers surface waters as a whole, without an artificial separation of navigable waterways as a distinct network. As a result, it has not been possible to isolate figures for navigable waterways.

This enlarged extract of the overall map on p. 41 shows how the borders of these water management bodies relate to the Spreewald conservation area and the Spree-Dahme network overall. Three separate boards intervene on the Spreewald: Oberland-Calau in the Lübbenau section, Nördlicher Spree in the central part and Dahme-Notte in the north-western part. It has not been possible within the scope of the present study to conduct the necessary research at the local level to identify all the funding arrangements in place.

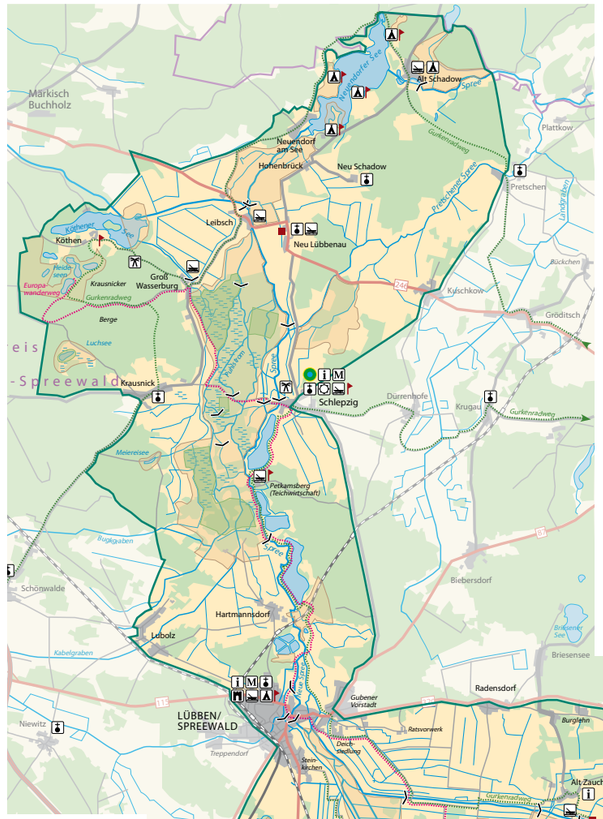


An illustration of the difficulty is provided by the detailed map on the next page, which was produced by the Spreewald authority, but without identifying the numerous small-lift boat locks which are spread throughout the network. For the present study we have identified and superimposed these boat locks (57 in all), to give at least an indication of the actual navigable network within the Spreewald.

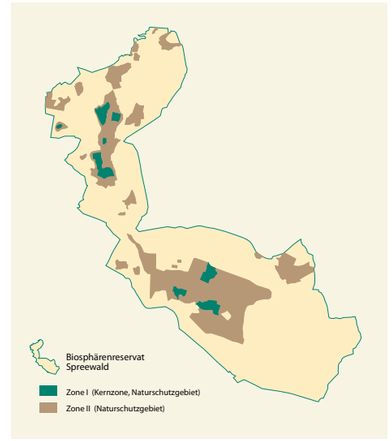
7.3.2 Key physical and management data

Extent of the infrastructure		
Length (km)	1300	no access to motorised craft without special authorisation, and those available with authorisation amount to a few hundred kilometres; no precise breakdown is available
Dimensions (metres) Length Beam Air draught Draught	8.00 2.00 1.60 1.00	dimensions available throughout the main routes open to motorised craft with authorisation
Number of locks	57	
Equivalent kilometres	1357	length of canals without distinction of size or navigability + 57 locks

The Spreewald biosphere reserve (within the green boundary) showing the complex meshed network of rivers and drainage canals, and 57 small boat locks.



Indicators of level of service	
Season operated	1st May to 30 September
Operating hours	High season: 9:00 to 17:00
Locks	Self-operated or local youths for pocket money; only the busiest locks manned



7.3.4 Funding

We have seen that Brandenburg's hydrographic network is split up into 26 water maintenance boards (*Gewässerunterhaltungsverbände*). Brandenburg is responsible for maintenance of waters in category 1. With very few exceptions, navigable waterways are all under this category, which means that their maintenance is the responsibility of the *Land* government.

In practice, however, it has not been possible to isolate the funding of navigable waterways within the Spree-Dahme area, since Brandenburg's budget is appropriated to the various boards overall, without distinction between navigable and non-navigable waters.

We can simply observe that major investments such as Kossenblatt and Kossoa locks were funded 75 % by the European Union.

Conclusions on funding and income profile	
case A – Federal waterways	
ADVANTAGES	*RISKS*
• Federal funds made available to fund the recreational waterways • Unified management of network for recreational boaters	• Funding source intrinsically unsustainable, since a reform is being actively promoted (current 'inherited' situation is the result of inertia following reunification in 1990) • No operating income from non-navigation functions • Very marginal income from boats (lump-sum licence paid by the Federations)
case B – Regional (*Land*) waterways	
• EU funding of 50 or 75% of the cost of lock restoration (e.g. Kossenblatt, opening up access to the Spreewald system). • The Region measures the benefits of waterway tourism for local economic development and employment, hence the ongoing investment programme • Long-established experience of running its own waterways provides a basis on which to build the future governance of the recreational waterway network as an entity	• Region may not be willing to spend as much on the canals from regional taxes as the Federal Government has traditionally paid from the national transport budget • Environmental lobby blocking investments to make certain waterways navigable in powered craft • No licensing or other income from boats or boat hire firms

8. Ireland - Shannon-Erne Waterway

Profile	
Ownership regime	State - cross-border
Management	North - South implementation body **Waterways Ireland**
Built	1840s, soon abandoned, reopened 1994
Length of waterway	63 km
Number of locks	16
Build cost	€30 M
Recurrent costs	€1.69 M
Capital expenditure	€0.05 M
Operating revenue	€0.03 M
Percentage public subsidy	98.3 %
Sustainability of funding	high

8.1 Description and background

The Shannon-Erne Waterway was the first large-scale canal restoration project to be undertaken outside Britain. The restoration was taken on as a North/South flagship scheme by administrations north and south of the border. Work commenced in 1990 and was completed in 1994 under the responsibility of project managers ESB Ireland, for about **£30 million**. It is in effect a new state-of-the-art waterway, following the line of the long-abandoned Ballinamore & Ballyconnell Canal. This canal had been built in the 1840s as a combined navigation and drainage scheme, but was never fully completed to navigation depth, and failed to attract traffic. The new waterway was justified by the growth in recreational use of the Shannon and Erne navigations. The section from Leitrim village to the summit level at Lough Scur used 8 of the original lock chambers with some modifications in levels, while the other 8 locks down to the Erne were reconstructed, widened and new weirs built. Unlike the Grand and Royal Canals, the Shannon-Erne can be navigated by most large river cruisers.

8.2 Key physical and management data

Extent of the infrastructure							
Length (km)	62.6	Canalised river	45.1 km	9 locks	Breakdown by county:		
		Canal	5.0 km	9 locks	Co. Fermanagh (N.I.)	1.4 km	1 lock
		Natural edge	12.5 km		Co. Fermanagh/Co. Cavan	10.1 km	
					Co. Cavan	12.8 km	2 locks
					Co. Cavan/Co. Leitrim	2.1 km	
					Co. Leitrim	36.2 km	13 locks
Dimensions (metres) Length	24.50						
Beam	4.50						
Air draught	3.20	over a 3 m width					
Draught	1.20						
Number of locks	16						
Equivalent km	69	45 km canalised river + 5 km canal + 20% of natural edge length (2.5) + 16 locks					

Management data (€ M)			
	2005	2006	2007
COSTS			
Operating & maintenance costs (goods and services)	**0.48**	**0.52**	**0.6**
Salaries and wages (operating)	**0.85**	**0.95**	**1.09**
Total recurring costs (annual)	**1.33**	**1.47**	**1.69**
Capital projects*	**0.3**	**0.13**	**0.05**
Total costs	**1.63**	**1.60**	**1.74**

FUNDING AND OPERATING REVENUE			
Operating revenue			
Lockage fees	0.03	0.03	0.03
Total operating revenue	**0.03**	**0.03**	**0.03**
Funding			
Government, Republic of Ireland Government (15%) and UK Government (85%)	**1.60**	**1.57**	**1.71**
Percentage public subsidy	98.2%	98.1%	98.3%

* covers infrastructural development, grouting of lock chambers, installation of new floating moorings, installation of new floating landing jetty etc.

Per equivalent kilometre, the apparent cost is **€ 25 200** and revenue **€ 440**.

Management data – staffing	
Personnel in the field (industrial staff including area foreman	19
Personnel in office (Shannon-Erne Operations Office)*	4
TOTAL	23

* plus headquarters support

Indicators of level of service	
Season operated	All year
Operating hours	Season April-October 9am – 8pm (or dusk if earlier than 8pm) Winter November-March 9am - 5.30pm (or dusk if earlier than 5.30pm)
Locks	Semi-automatic operation by smart card. Waterway Patrollers located at lock 1 and lock 16 at entry and exit to navigation with roaming Waterway Patrollers available between lock 2 & lock 15.
Traffic	Lock 16 2560 average lock passages per annum. Lock 1 3139 average lock passages per annum.
Personnel in attendance	1 Waterway Patroller each at lock 1 & lock 16 with four roaming Waterway Patrollers covering the remainder of the system – total 6 during high season, 1 during closed season.
Training	All staff have received customer service training.

Shannon Erne Waterway - survey of origins of transnational traffic*

Origin	1995	1997-98	2004
Republic of Ireland	35%	46%	67%
Northern Ireland	13%	10%	8%
Great Britain	11%	33%	7%
Germany	24%		9%
Other Europe	4%		n/a
Elsewhere	2%**	3%	n/a

* percentages do not add up to 100% since some respondents did not provide this information
**e.g. Australia, USA

8.3 Relative confidence

Waterways Ireland's executive director feels that the long-term funding of its waterways is secured, through a combination of three factors:

– the emblematic force of the Shannon-Erne Waterway itself as a uniting factor for the island,

– the awareness among decision-makers in both governments of the significant non-quantifiable benefits of the inland waterway network ('it's not about economics, it's about health and quality of life.')
– successful collaboration with Tourism Ireland in developing joint marketing materials and campaigns.

This latter point is particularly important, because elsewhere (e.g. in Brittany and Scotland), the tourism sector focuses exclusively on coastal sailing, and does not include inland waterways. This was true a few years ago in Scotland, and was true still in 2008 in Brittany.

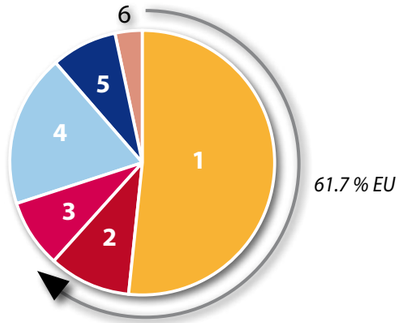
8.4 Amount and delivery of public funding

a) Capital works – initial build or restoration

Capital projects are funded 100% by the respective government department(s) in that jurisdiction. Republic of Ireland projects are included in the National Development Plan.

The initial investment of €30 M, in 1990-94, was funded as follows:

	Shannon-Erne Waterway (€ M)		%
1	E.C. Structural Fund	**15.5**	*51.7*
2	E.C. Interreg Fund	**3.0**	*10.0*
3	Electricity Supply Board	**2.5**	*8.3*
4	International Fund for Ireland	**5.6**	*18.7*
5	Northern Ireland Authorities (Part E.C. Fund)	**2.4**	*8.0*
6	Irish Soldiers & Sailor Fund	**1.0**	*3.3*
	TOTAL € M	**30.0**	*100*



It is of interest to note that the current project to restore a 13 km length of the Ulster Canal, over the next 6-7 years, is to be 100 % funded by the Republic of Ireland, for a total of **€35 M**.

Ongoing capital expenditure on the Shannon-Erne Waterway concerns infrastructural development, grouting of lock chambers, installation of new floating moorings, installation of a new floating landing jetty, etc.

b) Recurrent costs

Recurrent costs are funded by the Department of Culture Arts and Leisure in Belfast and the Department of Community, Rural and Gaeltacht Affairs in Dublin on the basis of a North/South split of 15% – 85%.

Annual business plans are submitted to two sponsoring departments for approval through the North-South Ministerial Council.

The annual business plan is developed and submitted to sponsoring Government Departments for consideration and ultimately granting of funds to the organisation all within the corporate planning framework.

c) Decision-makers' relative understanding of the waterway's needs

There was no particular issue with understanding of the waterway's needs. This relates to the perceived benefits of the waterways in general, and the Shannon-Erne Waterway in particular, as a vector for local economic development.

d) Operating revenue

There is no significant income stream. Boat licences are shown in the 'funding' table under § 8.2. There are also some property leases, for small amounts.

e) Political/funding risks

It is felt that if funding were reduced across the board, then maintenance would suffer, but this would not call into question the integrity or operation of the network.

The risk exists more on the capital side than in the recurring costs, where a worst case scenario would be to call into question ongoing capital programmes to extend the network, without threatening the existing network.

8.5 Achievements/factors of success

- Delivery of an attractive recreational destination which is available to customers generally on a year-round basis.
- Good customer service provided by the Waterway Patroller team covering the locks and public moorings.
- Maintaining the attractive and varied waterway environment and built heritage.
- Providing a key link in the waterways network between two significant waterways.
- Working with private-sector developers on the delivery of additional marina capacity and waterfront residential developments.
- Development of the waterway's angling potential and infrastructure.
- Development of walking routes along the waterway.
- Maintaining local jobs.

8.6 Future management challenges/projects

The essential challenge is to bring more visitors to the canal, which involves wider-ranging marketing efforts with the Tourism boards on both sides of the border.

8.7 Conclusion

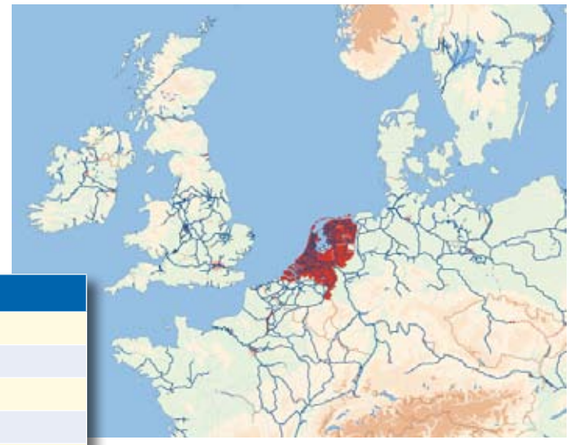
The Shannon-Erne Waterway is considered to be a successful operating waterway, and there is at present no perceived threat to the sustainability of its funding and operation.

There is clearly a widespread appreciation of the socio-economic benefits delivered by the waterways in Ireland, and the way the Shannon-Erne Waterway has levered changes in the counties on both sides of the border is a source of universal satisfaction.

There does not appear to be pressure from the two governments on Waterways Ireland to cover a higher proportion of its annual costs from operating revenue.

Conclusions on funding and income profile	
ADVANTAGES	*RISKS*
• Binding intergovernmental agreement on maintenance and operation of the waterway network throughout the island • Investments continuing with the Ulster Canal underline the force of this agreement • Benefits of waterway tourism are perceived on both sides of the border	• Different policies may emerge North and South, which could call into question the terms of the agreement, OR ongoing investments

9. Netherlands - upland canals of Drenthe



Profile	
Ownership regime	Drenthe Province
Management	Provincial Government
Built	18th - 19th centuries
Length of waterway	154 km
Number of locks	16
Build cost	€ 32 M (for Erica-Ter Apel Link)
Recurrent costs	€ 2.6 M
Capital expenditure	€ 0.4 M
Operating revenue	€ 0.05 M
Percentage public subsidy	98.3 %
Sustainability of funding	high, but dependent on provincial roads budget

9.1 Description and background

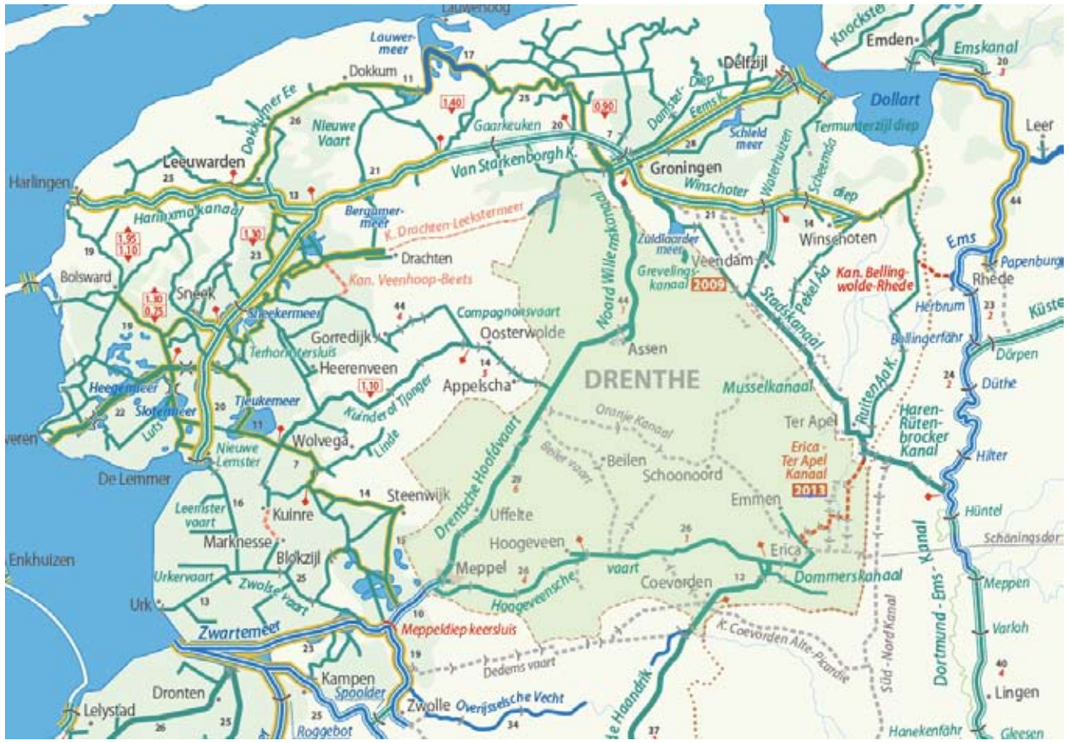
The upland canals in the inner provinces of the Netherlands were built in the 18th and 19th centuries to bring extensive peat moor lands under cultivation. The first to be built in the overall region illustrated here was the Stadskanaal, which was completed in 1787. The Haren-Rütenbrocker Canal, extending it to the river Ems in Germany, was built in 1870-76, with the same dual functions of drainage and navigation.

The Oranje Kanaal was opened in 1854. This canal and several others were built by private company, the Drentsche Veen- en Middenkanaal Maatschappij (DVMKM).

These canals are of interest for the present study because of the restoration works already completed and currently projected, and because of challenges faced by the provincial authorities.

Another feature of interest is the new extensions for recreational boating recently completed or expected to be completed in the coming years. The most ambitious project involves restoring through navigation on the old canals between Groningen and Drenthe/Overijssel provinces. Two north-south canals closed in the late 1960s (the Barger Compascuüm and Scholtens Canals) have both been partly infilled and built on, but parts of both will now be included in a new route between Erica and Ter Apel, which could be opened in 2013.

Considering that this new canal lies almost exclusively within the Province of Drenthe, and to facilitate comparisons, we are here focusing on the case of this province alone, which presents more unified characteristics and funding issues than the waterways of Groningen Province to the north.



Location and connections of the Drenthe canals

The above location map shows how at present no circular cruise is possible in the province or its adjacent area. There are two links with Overijssel to the south, one with Friesland to the west, and one with Groningen to the north (plus two peripheral connections from two lakes on the northern border). This situation makes Drenthe a place to cruise through, rather than a cruising area as such.

9.2 Key physical and management data

The canals of Drenthe became a single operational entity in 1993, when the Province agreed to take over the last remaining State-owned waterway, the Noord Willemskanaal, Drentsche Hoofdvaart and Meppelerdiep, forming the main route through the province. Commercial traffic is still present, but only at each end of this route, to Assen and Meppel respectively. They are managed under the responsibility of a single department of the Province administration, which covers roads and canals.

Extent of the infrastructure		
Length (km)	**154**	Currently in operation, hence not including the Erica-Ter Apel link
Dimensions (m) (Drentsche Hoofdvaart) Length	26.00	Length 65m on the NWK and 110m on the Meppelerdiep
Beam	5.80	Beam 7.50m on the NWK and 12m on the Meppelerdiep
Air draught	5.30	
Draught	1.55	Draught 2.50m on the NWK and 3.25m on the Meppelerdiep
Number of locks	**16**	
Number of movable bridges	**25**	There are many other bridges that are on local roads and, as such, operated by the municipalities and not the Province (total 66)
Equivalent kilometres	**195**	154 km + 16 locks + 25 movable bridges on provincial roads

Management data (€ M)			
	2005	2006	2007
COSTS			
Operating & maintenance costs (goods and services)	n/a	n/a	**0.7**
Salaries and wages	n/a	n/a	**1.9**
Total recurring costs (annual)			**2.6**
Capital projects	n/a	n/a	**0.4***
Total costs			**3.0**
FUNDING AND OPERATING REVENUE			
Operating revenue			
Total operating revenue (negligible)	n/a	n/a	**0.05**
Funding			
Provincial government, through the roads budget			**2.9**
Percentage public subsidy			98.3%

* not including provision for major overhaul and replacement of movable bridges. This is on average €1 M per bridge, but covered outside the specific canals budget.

Per equivalent kilometre, the apparent cost is **€ 15 400** and revenue **€ 260**.

Management data (staffing)		
Personnel in the field	10	permanent staff equivalent full time staff (40 temporary staff each working 3 months)
Personnel in office (province)	3	
TOTAL	23	

Indicators of level of service	
Season operated	**Summer**: end April to mid-October, except for the Drentsche Hoofdvaart to Assen, open all year **Winter**: ice skating when weather allows
Operating hours	High season: 7:00 to 18:00 Rest of year: 8:00 to 18:00 Saturdays, generally open morning only (to 13:00); closed Sundays and public holidays Times applicable to the main route; may be restricted on the other canals e.g. on the canal through to Friesland, lunch break 12:00-13:00 Opening of railway bridges invariably restricted to off-peak hours.
Locks	Lock-keepers present (except for newly automated locks on main route, mentioned above)
Traffic	One barge per week unloading in Assen (i.e. from the north, leaving the Drentsche Hoofdvaart with recreational traffic only) Recreational traffic only, approx 4000 boats/year on the main route, 2500 boats/year on the route east to Coevorden.
Transnational ?	Transit accounts for more than 70% of this traffic 40% of boats from Drenthe, 25% from Groningen, 20% from Friesland, 12% from the rest of the Netherlands, and 3% from Germany
Land-based visits	Very substantial numbers, particularly cyclists.

9.3 Relative confidence

The level of confidence is mitigated. On one hand, the canals have been declared a key element of the development strategy of the province for local economic development driven by tourism. One missing link has been built in the north of the province, creating a route reserved for recreational boating between Groningen and Ter Apel. (This link concerns the Drenthe town of Zuidlaren and the Zuidlaarer Meer, shared with Groningen.)

The above-mentioned missing link from Ter Apel south to Erica is currently at the detailed design stage, and funding has been agreed, for an overall investment of **€32 M**. Drenthe Province has been playing the role of facilitator for the Netherlands Recreational Waterways Foundation (SRN), by designing and producing the foundation's policy documents, including all the mapping.

Despite this dynamic, the main interviewee, who has been working on Drenthe canals since the 'commercial' era (when the Drentsche Hoofdvaart and Noord-Willemsvaart were a State waterway) feels an intrinsic vulnerability in the system, related to the relative lack of heritage and tourist sites in the province, the mainly uninspiring rural landscapes, hence the relatively small number of boats using the canals.

Accordingly, there is perceived to be a risk of provincial elected representatives potentially deciding to reduce funding, if they were presented with a precise audit solely on the canals, which are currently managed under a common budget with the 450 km of provincial roads.

A further cause for concern is the sudden increase in costs which will have to be borne by the Province from 2023, when the Rijkswaterstaat will withdraw its financial contribution under the so-called '30-years rule'. By law, the State as conceding body is obliged to continue to pay the running costs for 30 years, to give the new owner time to build up its appropriate organisational structure and funding model.

In other words, there is already concern in 2009, half way through the 30-year transitional period, at the loss of Government funding of **€2.5 M** per year from 2023.

9.4 Funding

a) Amount and delivery of public funding

We have seen that central Government pays **€2.5 M** per year towards the operation and maintenance of the Drentsche Hoofdvaart and Noord-Willemsvaart. The other main source of funding is the provincial road tax. Drenthe levies a road tax of €74 per capita, or roughly **€36 M** in total (for a population of 485 000).

This amount covers the operation, maintenance and staffing of 450 km of provincial roads and the 80 km of canals not covered by the Rijkswaterstaat agreement.

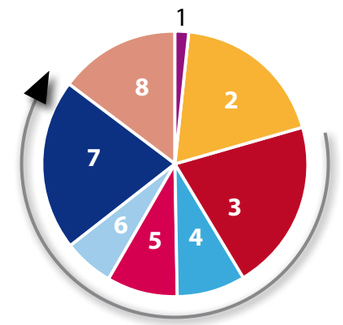
We have not been able to obtain a precise breakdown. In a first approximation, counting each km of canal as equivalent to 1.5 km of road, the ratio would be approximately 15:4, i.e. 21% of the Province's own budget imputable to the canals not covered by the Rijkswaterstaat agreement.

This would result in a total of €36 M x 21% = approximately **€7.6 M** for the canals. Adding the previously indicated State fund of **€2.5 M**, that would make a total of **€10.1 M** for the complete network. The costs actually imputed to the canals are much lower, as indicated in the table above.

Investment in new link

Regarding the new Erica-Ter Apel link, the total investment is estimated at **€32 M**. The funding for the works which remain to be completed is assembled as follows.

	Erica - Ter Apel Canal (€ M)		%
1	SRN-managed regional investment fund (earlier programme, covering initial works)	**0.40**	*1.7*
2	SRN-managed fund, 2008-2013	**4.40**	*19.0*
3	Drenthe Province	**4.80**	*20.8*
4	Groningen Province	**1.92**	*8.3*
5	Waterschappen (provincial drainage boards in Drenthe and Groningen)	**2.00**	*8.7*
6	Communes federated in the *Agenda voor de Veenkoloniën*	**1.38**	*6.0*
7	Emmen municipality	**4.80**	*20.8*
8	Other subsidies	**3.40**	*14.7*
	TOTAL € M	**23.10**	*100.0*



64.6 % Local authorities at different levels

It is of interest to note that a 1.7 km length of the canal was built a few years ago in the peat-farming theme park (Veenpark), between Klazienaveen and Barger Compascuum, with a lock 30 by 5.25 m, at a cost of €2 M. The entire 12 km length from Ter Apel to this Veenpark Canal is to be completed and opened to navigation in 2010, for an overall cost of €13 M. On the remaining section from Veenpark to Bladderswijk detailed design and filing of planning permission is proceeding, and the Province hopes to be able to start works early in 2010. These will cover 2 km of the former Scholtenskanaal and 5 km of completely new canal sections. They will include a double staircase lock for a lift of 5 m. The estimated cost of this lock is €2 M, out of a total of nearly €20 M for the outstanding works.

b) Possible improvements

One possible improvement is the institution of a national boat licence, which would generate income from boaters in a more sustainable way than through the levying of tolls at countless locks and movable bridges. This is under discussion in 2009.

Another improvement (typically applied by waterway authorities in France also), is the move to cut costs by installing automatic operation of locks and bridges, remotely controlled and monitored. On the Hoogeveense Vaart, 3 locks and 4 bridges will shortly be controlled from one operating centre.

Another improvement will be the completion of the missing link, which will significantly increase the attractiveness of Drenthe's canals for boaters from Germany and Friesland. This will also help to raise the tourist profile of Drenthe, and help politicians to see the expenditure on canals as being worthwhile in economic terms.

c) Decision-makers' relative understanding of the waterway's needs

At present, the canals' needs are well understood. This is symbolised by the almost universal recognition of the lift-bridge (or other movable bridges) as essential infrastructure. The lift-bridge is an icon of the Netherlands, and as such needs to be maintained and operated. The concern mentioned above relates to the very high costs involved. There seems to be a historic understanding that roads and canals share the burden, although in reality the bulk of the costs of these structures is imputable to navigation. The electric and mechanical equipment of a lift bridge needs to be replaced every 15 years, and a typical budget for this is **€2 M**. Then there is the staffing. The figures add up very quickly, considering that there are approximately 70 movable bridges on the network.

d) Operating revenue

Revenue is negligible. Boats cruise free of charge. There is a very small income, from charges on residential moorings. The charge was introduced in 2006, to formalise the authorisation for boats to stay in certain locations throughout the winter months (November 1st - April 1st). The locations are Meppel, Coevorden, Assen and Emmen, and the charge is at present only €100 per boat.

Coevorden, a genuine 'canal' destination that has become popular despite its remoteness and limited connections (only west or south, pending completion of the Erica-Ter Apel link).

9.5 Achievements/factors of success

The first and historic achievement of Drenthe was the takeover of the Drentsche Hoofdvaart and Noord-Willemsvaart from the Rijkswaterstaat, thereby avoiding closure of the navigation.

The second was the publication in 2000 (5 years after its foundation) of the SRN's strategy for development of the country's recreational waterway network. This provided the context for initial planning of the Erica-Ter Apel link, the most ambitious recreational waterway investment in the country, involving several kilometres of entirely new canal. The project was then supported by the construction of a length of canal including a new lock in the Veenkoloniën ecological park and open-air museum half way along the route.

Now the project is in the final planning stages, and is supported by a grant of **€ 3.18 M** from the SRN under its new strategic plan for the period 2008-2013. Drenthe is the province which receives the most support, which shows that there is a clear understanding of the importance of completing the network in this relatively underprivileged part of the country (cf. Ireland and its peat-farming areas). (Other projects in Drenthe will receive **€ 1.67 M** from the budget managed by SRN, the *Investeringsbudget Landelijk Gebied*, or regional development fund.

The transnational marketing campaign (i.e. shared with East Friesland in Germany) has also been successful in making the 'Land of Peat and Honey' a destination for boaters. Some German clients of the Freisland hire bases deliberately leave the Friesian lakes and canals to make the circular cruise through Drenthe, heading south from Groningen to Assen then returning via the Opsterlandse Compagnonsvaart. This confirms that there is a market for 'canal cruising' as distinct from the historic boating holiday product which is 'encapsulated' within areas of more conventional tourist appeal.

'Viertoren' lift bridge on a restored length of the Barger Compascuümsvaart, forming the first section of the Erica-Ter Apel link where it enters Drenthe from the north.

9.6 Future management challenges/projects

A difficult challenge facing the province is planning permission to cut the new length of the Erica-Ter Apel Canal, especially where it cuts through a wood. The Netherlands authorities are understandably sensitive where natural conservation areas are concerned, but the project team is nevertheless confident that permission will be obtained.

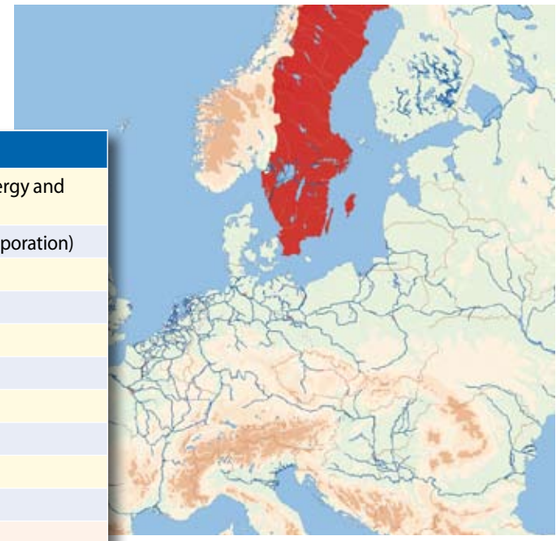
A fundamental issue is the attractiveness of the future waterway for boaters, and great pains are being taken to ensure that cruising will be as pleasurable as possible. For this reason, the 5m difference in level in the woodland area east of Emmen, up to the summit level at 19.60 m, will be overcome by a double staircase lock instead of a single chamber lock, which the designers feel would be less attractive for boaters in this region.

Once completed, it is hoped that transnational boat movements in Drenthe will increase significantly, but there remains a significant handicap in this regard, which is the absence of a second cross-border link with Germany. German boaters entering the Netherlands via the Haren-Rütenbrocker Canal and proceeding south to Emmen and Coevorden then have to make a very long circular cruise south and back via the Rhine or north and back via the Emden estuary.

The SRN has been working with the German authorities on developing plans for two other cross-border links, the Bellingwolde-Rhede Canal to the north (which would be a new cut) and the Almelo-Noordhorn Canal to the south (restoration of an abandoned canal), but there appears to be strong opposition among environmental protection bodies on the German side. The project partners in the Netherlands hope to overcome this opposition, and the **World Canals Conference in Groningen in 2011**, with visits to sites in Germany, is expected to contribute to the process.

Conclusions on funding and income profile	
ADVANTAGES	*RISKS*
• Integrated management of the whole network by the Provincial government • Integration of canals into the transport infrastructure network with roads means rationalisation and cost savings	• Drenthe Tourism has gone into liquidation, creating an unstable environment for tourism development • The Province has relatively few attractions for tourism • Canals are relatively costly to operate on account of the numerous movable bridges • Certain canals may be closed or their season shortened, or whatever other measure may be determined at the political level in the province, to cut costs

10. Sweden - Göta Canal



Profile	
Ownership regime	State, Ministry of Enterprise, Energy and Communications
Management	Göta Kanal Company (public corporation)
Built	1810 - 1832
Length of waterway	190 km
Number of locks	65
Build cost	n/a
Recurrent costs	Swedish Krona (SEK) 13.5 M
Capital expenditure	SEK 47.0 M
Operating revenue	SEK 40.0 M
Percentage public subsidy	33.9%
Sustainability of funding	high

10.1 Description and background

The Göta Canal, 190 km long, establishes a sea-to-sea route across Sweden, connecting Lake Vänern to the Baltic Sea. Access to Vänern from the Baltic is via the Trollhätte Canal, opened in August 1800. The success of this project encouraged Count Baltzar von Platen to take off the shelf the 1781-84 plan for a canal across Sweden from east to west, and submit it once again to royal approval. At von Platen's invitation, Thomas Telford worked in 1808 on detailed layout of the canal and siting of the locks. Work started in 1810 and the canal was opened on September 26, 1832.

The Göta Canal proper starts at Sjötorp on the east side of Lake Vänern and runs through Lakes Vättern and Roxen to Mem on the Baltic, whence boats can pass through sheltered waters to the Södertälje Canal, thence to Lake Mälaren and Stockholm. There are 65 locks in all, including the remarkable 7-rise staircase at Berg. The canal's summit level is 91.8 m above sea level. The Göta Canal is one of Sweden's biggest tourist attractions. It is particularly attractive for yachtsmen, being a standing-mast route (up to 22 m), while passenger vessels operate throughout the canal from Gothenburg to Stockholm, a cruise which takes 4 to 5 days.

It continued to be owned by the descendants of tycoon André Oscar Wallenberg (founder of the Company for Swedish Canal Steamboat Transit Traffic in 1851) until 1978, when the Government acquired the asset as national heritage.

10.2 Key physical and management data

Extent of the infrastructure			
Length (km)		**190**	Total km, breaking down as follows: – free-flowing river 0 km – canalised river 0 km – canal 87 km – natural edge (lakes, estuary) 103 km
Dimensions (metres)	Length Beam Headroom Draught	30.00 7.00 22.00 2.82	This is the effective dimension available to vessels; locks are 32 m long
Number of locks		**65**	The Göta Canal Company counts the 2-rise and 7-rise staircases at Berg as single 'lock-stations'; for the present analysis, it is a truer reflection of the infrastructure to count the lock chambers
Number of movable bridges		**47**	
Equivalent km		**219**	Counting 87 km plus 20% of the length of 'natural edge' navigation (20), 1 km per lock (65) and 1 km per lift bridge (47).

Management data (million Swedish krona - SEK)				
	1995	2005	2006	2007
COSTS				
Operating & maintenance costs (goods and services)	**7.0**	**8.0**	**8.0**	**8.0**
Salaries and wages (operating)	**4.0**	**5.0**	**5.0**	**5.5**
Total recurring costs (annual)	**11.0**	**13**	**13**	**13.5**
Capital projects*	**47.0**	**47.0**	**47.0**	**47.0**
Total costs	**58.0**	**60.0**	**60.0**	**60.5**
FUNDING AND OPERATING REVENUE				
Operating revenue				
Recreation fees - private boats	n/a	n/a	n/a	9.0
Recreation Fees - passenger/hotel boats	n/a	n/a	n/a	2.5
Forest management	n/a	n/a	n/a	4.5
Land rental	n/a	n/a	n/a	1.5
Property rental	n/a	n/a	n/a	8.0
Payment by State to cover bridge maintenance	n/a	n/a	n/a	3.0
Other	n/a	n/a	n/a	11.5
Total operating revenue				**40.0**
Funding				
Central Government, through Ministry of Enterprise, Energy and Communications				**20.5**
Percentage public subsidy				33.9%

*The company has a 10-year maintenance plan which is supplemented by short-term and emergency maintenance.

Per equivalent kilometre, the apparent cost is **SEK 276 300** and revenue **SEK 182 600**.

Management data (staffing)	
Personnel in the field (f.t.e.)	75
Personnel in office (Motala)	10
TOTAL	85

Indicators of level of service	
Season operated	May 1 - September 27 (dates for 2009)
Operating hours	High season June to August 9:00 to 18:00 Low season Starting at the entrance locks on Mon, Wed and Fri, reservations required.
Locks	All locks are operated by lock personnel (hydraulic gear). The lock-keeper provides a comprehensive service to boaters and is proud of his/her lock. Students (minimum age 18) are employed during the high season to make up the required staffing level. They are required to have language skills and driving licence.
Traffic Transnational ?	(No freight) – Recreational traffic: approx 4000 boats/year at the average lock. Transit accounts for about 70% of the traffic. Swedish boaters account for 50 % of movements. 50 % is made up of Germans, Danish, Norwegians, Dutch and others (in order of share of market).
Training	Obligatory training in service behaviour and knowledge of canal history and nearby tourist attractions.

10.3 Relative confidence

The Managing Director is very confident in the future of the canal, and the sustainability of its business in tourism and other areas. It has unique value as heritage for the Swedish nation and makes a major contribution to promotion of the corridor and the image of the counties it crosses. Under these conditions, and in view of the very modest subsidy from the budget of the Ministry of Enterprise, Energy and Communications, there appears to be no reason to fear an interruption of this subsidy, or a change in ownership.

10.4 Funding

a) Amount and delivery of public funding

At present, the Ministry of Enterprise, Energy and Communications, to which the canal company is responsible, subsidises the operation for a stable amount of **SEK 20 M** per year. This follows a long-term decision by the Swedish Government to support this unique component of the country's transport infrastructure, which is evidently considered to give excellent value for the money spent annually.

Confidence relates also to the quite substantial sums earned by the company, a legacy of the historic ownership structure and the substantial estates included in the canal's corridor. The Göta is without doubt the waterway in this sample which bears the most resemblance to British Waterways. It has full powers to act commercially on its own property, and has been doing so successfully for many years. As a not-for-profit public company, the Göta Kanalbolag AG reinvests the money it earns on the canal itself and on real estate.

The total turnover in 2008 was approximately **SEK 60 M**, including the above-mentioned Government subsidy of **SEK 20 M**. This is paid in two instalments each year (every 6 months). The amount is fixed and guaranteed, until such a time as the canal's owner may decide differently. As stated above, this is not thought to be a serious risk.

The total operating revenue given above (SEK 40 M) suggests a percentage public subsidy of 33 %. This would in fact be considerably higher if the non-navigation functions were isolated from the company's accounts.

b) Possible improvements

The short season is the biggest handicap faced by the canal company. There is thought to be potential for more use of the canal towards the end of the season. Efforts are being made to incite the passenger boat operators to run autumn cruises. Another policy under consideration is an overall reduction in tolls for use of the canal.

c) Decision-makers' relative understanding of the waterway's needs

The canal company enjoys a high level of understanding and respect for its business within the Government and the Ministry.

d) Political/funding risks

As already indicated, the Göta Canal Company has been carefully managed over the years, under the successive directorships of Thord Söderlund, Claes-Göran Österlund and now (since 2008) Anders Donlau, and is a 'streamlined' organisation with relatively low overheads compared to other waterways in this sample.

The 'temptation' to reclassify the waterway from a national to a regional asset has already been experienced, in the late 1990s, and was carefully examined as a possible strategy (cf. *Ownership of a Cultural Landmark: the Case of the Göta Canal*, by Per-Olof Bjuggren, and *Göta canal – a national asset with economic values* by Jan Lindvall, and especially *East is east and west is west: municipal co-operation and regional networks around the Göta canal* by Dr. Geoffrey D. Gooch, Jean Monnet Professor in European Political Integration, Linköping University, 2000. These studies were undertaken in the context of the EU-funded Terra VEV programme).

Geoffrey Gooch provided convincing arguments against regionalisation of this national asset. He pointed to significant differences in the approach to development in the two counties, separated – as the canal itself is divided – by Lake Vättern. They differ in their economic profile, as well as in the forms of cooperation that they have developed. Västergötland communities have a longer and deeper tradition of cooperation than those in Östergötland, and have already developed forms of cooperation around the canal. In the east the cooperation among canal municipalities is new and is in fact creating new networks of municipalities that have a common interest in canal development and the implementation of related policies. These networks bring together politicians and officials from both high and low levels of administration, in some cases adding special-interest groups and representatives of private businesses. In theory policy networks can be quite large but they may also only consist of a few key people. The relative size and resources of the potential partners may influence cooperation, as may a municipality's dependency on the outside world, and the importance that is placed on the issue.

In the case of the Göta Canal the incentive for cooperation is not only based on the belief that this will lead to more efficient marketing of the canal as an attraction and therefore economic advantages for the participating municipalities. Cooperation is also seen as a means of developing regional synergies in general. The incentives for regional cooperation include an awareness of the vulnerability of individual municipalities, the increased demands made upon the municipalities by the central authorities, changes in trade and industry, competition with other regions, and the development of a new political and administrative ethic.

In short, it was found to be preferable to guarantee the infrastructure at the national level through the company, with its proven efficiency, and to allow the counties and their municipalities to continue developing the potential offered by the canal on the land side.

10.5 Achievements/factors of success

The business model for the canal's activities has been constantly refined and improved over the years, and development opportunities have been carefully exploited. Many historic canal buildings, especially lock cottages, have been converted into hotels, youth hostels and for other commercial uses, which all serve to enhance the visitors' experience as well as bringing in rent. Common marketing of the entire canal's resources means that there is a high level of synergy among all operations in the corridor.

The canal was listed in 2007 as Sweden's most important industrial heritage site; this was a milestone in the canal's history, and bodes well for continued support by the population and politicians.

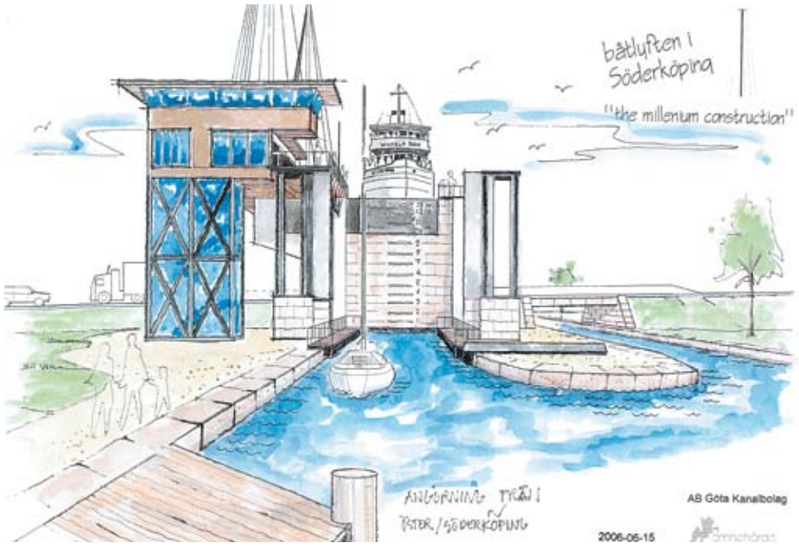
The popularity of the North Sea-Baltic route is well-established; the route is still used for transit, while supporting a healthy traffic of regionally-based boats.

An additional asset for the canal in Östergötland is the Kinda Canal, which extends the potential cruising area by 90 km, south from Linköping to Hycklinge. A boat transport service is available from here to Gamleby on the Baltic.

10.6 Future management challenges/projects

The status of the canal as a standing-mast route has given rise to a debate on how to route a new motorway over the canal at its eastern end. The saturated subsoil in the low-lying land close to the Baltic Sea makes it unfeasible to burrow under the canal (as the Dutch have just done in Friesland), so plans have been drawn up for an extraordinary combination of a fixed aqueduct and vertical lifts on either side.

The estimated cost of these structures is SEK 300 M.



Discussions continue, but this may actually be built and opened by 2013. Boats with limited air draught, cyclists and pedestrians will be able to proceed under the bridge to the right in this illustration.

10.7 Specific issues

a) Waterway tourism

A current challenge is to market canal trips as an attraction continuing to the end of the operating season in late September. There is a tendency in Sweden to take holidays in July, and even August is much less popular, let alone September. The new director has indicated this as one of his objectives.

b) Environmentally-sensitive engineering

After using steel lock-gates for many years, the canal is now again building replacement lock-gates in timber. A presentation given at the World Canals Conference in Trollhättan in 2005 showed how the original lock-gate design was a better long-term solution than steel gates. The gates are made in specialist workshops (as on the Rideau Canal in Canada).

Conclusions on funding and income profile	
ADVANTAGES	*RISKS*
• Financial stability historically ensured by the private canal company's investments and management, 'inherited' by the State • Operating income from estates, private boats and trip boats covers 60% of expenditure • National monument status	• Short operating season • Pressure to reduce cost of licences for boat passage

11. USA – the New York State Canal System

Profile	
Ownership regime	State of New York
Management	New York State Canal Corporation, subsidiary of the Thruway
Built	1899-1918 (in current configuration)
Length of waterway	844 km
Number of locks	57
Recurrent costs	US$ 53.2 M
Capital expenditure	US$ 41.1 M
Operating revenue	US$ 1.86 M
Percentage public subsidy	98.0%
Sustainability of funding	high, but separation from Thruway is considered necessary

11.1 Description and background

The New York State Canal Corporation is a stand-alone subsidiary of the New York State Thruway Authority, which has responsibility for both the New York State Thruway (highway) system and the canal system. Prime responsibilities of the Thruway Authority related to the Canal are the maintenance and operation of the total system. The canal system is 524 miles (843 km) long and drains a watershed of approximately 5500 square miles (8851 km^2).

This canal is the icon of American Canals and has a long and illustrious history starting with canal construction in 1817 and opening for navigation in 1825. It has gone through a number of enlargements. However, with the growth of railroads, highways and the opening of the St. Lawrence Seaway in 1959, commercial traffic on the canal declined dramatically. Today vessel traffic is primarily recreational boats. The need to make the canal self-supporting was recognised. A Canal Recreation Way Commission was established and a revitalisation plan was developed and initiated in 1996. In 2001 the canal was also designated a National Heritage Corridor, giving it recognition and the possibility of funding at the Federal level.

The Thruway Authority and the Canal Corporation have the same chair and board members. This arrangement allows the canal to access Thruway funds, to share staff, assume liability, raise bonds, assume debt and to lease property. The Director of the New York State Canal reports to the Board and is accountable for the day-to-day operation of the canal as well as carrying out policy. The Canal is divided into three divisions for administrative and operational purposes.

This example is a unique case among all the waterways considered under the present study. This was historically a 'regional' waterway since its completion as the New York State Barge Canal in 1918. Here the question of transfer to a delegated authority was addressed in the early 1990s, the New York State Canal Corporation was created in 1992 as a subsidiary of the New York State Thruway Authority, and the transfer effectively made in 1994.

The New York State Canal Corporation is responsible for the operation, maintenance and promotion of the system, which consists of the Erie Canal, Cayuga-Seneca Canal, Oswego Canal and Champlain Canal. It is also develops and maintains the New York State Canalway Trail and is involved in the general development and promotion of the Erie Canal Corridor as both a tourist attraction and a working waterway.

The current director of the New York State Canal Corporation is Carmella Mantello, who was appointed to the position by Governor Pataki on June 21, 2005.

In May 2006, Governor Pataki proposed recreating the Canal Corporation by 2010 as an independent agency, which would no longer be under the responsibility of the Thruway Authority.

This issue remains unresolved to date, but there are hopes that it will be, to guarantee the future of a national treasure and an international symbol of engineering ingenuity, the New York State Canal System.

Waterford locks at the entrance to the system from the Hudson River; Although almost as large as the European Class IV standard, the locks remain small by American Great River standards

11.2 Key physical and management data

Extent of the infrastructure			
Length (km)	844	Total km, breaking down as follows: – free-flowing river 0 km – canalised river 437 km (271 mi) – canal 248 km (154 mi) – natural edge (lake/reservoir, etc) 159 km (99 mi) Breakdown by section of network	

Waterway	Canalised river	Canal	Natural edge
Erie	312	206	42
Oswego	39		
Champlain	60	37	
Cayuga-Seneca	26	5	117
Totals	437	248	159

Dimensions (metres)	Length	91.00	this is the effective dimension available to vessels; locks are 100m long
	Beam	14.00	
	Headroom	4.70	increased to 6.40m in the Mohawk Valley and on Oswego Branch (5.20m on the Champlain, 5.00m on the Cayuga & Seneca
	Draught	1.50	Erie 4.25/3.65 m*, Oswego 4.25 m, Champlain 3.65 m, Cayuga-Seneca 3.65 m
Number of locks		57	
Number of movable bridges		17	This is the number of separate lift-bridges operated by roving operators dedicated to the bridges (i.e. not including lift bridges operated at locks)
Equivalent km		791	Counting 685 km plus 1 km per lock (57), 1 km per lift bridge (17) and 20% of natural edge (32).

* Efforts are under way to return the canal to its published depth of 4.25m (14 ft) from Waterford to Oswego and 3.65m (12 ft) elsewhere.

Management data (US$ M)			
COSTS	2005	2006	2007
Operating & maintenance costs (goods and services)	-	-	-
Salaries and wages (operating)	44.0	53.9	53.2
Total recurring costs (annual)	44.0	53.9	53.2
Capital projects	19.6	13.6	41.1
Total costs	63.6	67.5	94.3
FUNDING AND OPERATING REVENUE			
Operating revenue			
Lockage fees, commercial	0.030	0.030	0.030
Lockage fees, recreational	0.240	0.240	0.240
Rental & concessions (land permits, leases, sales & work permits)	1.300	1.300	1.300
Hydropower generation	0.120	0.120	0.120
Other	0.170	0.170	0.170
Total operating revenue	1.86	1.86	1.86
Funding			
State, through Thruway toll revenue	61.6	65.9	92.4
Percentage public subsidy	96.9%	97.6%	98.0%

Per equivalent kilometre, the apparent cost is **$ 119 200** and revenue **$ 2 350**. The cost is the highest cost of all the sample waterways, but only by a small margin considering the very large dimensions of the canal and its structures, adapted for 2000-tonne barges.

Management data (staffing)	
Personnel in the field	492
Personnel in Canal Corporation head office	50
TOTAL	542

Indicators of level of service	
Season operated	May 1 - November 15 (depending on weather)
Operating hours	High season May 22 - September 3 7:00 to 22:00 Low season May 1 - May 22 / September 4 - November 15 } 7:00 to 17:00 Saturdays, generally open morning only (to 13:00); closed Sundays and public holidays Times applicable to the main route; may be restricted on the other canals, e.g. on the canal through to Friesland, lunch break 12:00-13:00 Opening of railway bridges invariably restricted to off-peak hours.
Locks	Recreational traffic: All locks are operated by lock personnel, a minimum of a lockmaster assisted at times by a roving lock operator. The lockmaster communicates with boaters by radio, grabs lines if not busy, sells passes, has pride of ownership of his/her lock station.
Traffic Transnational ?	Freight: < 100 barges per year on the system Recreational traffic: 142 243 lockages, i.e. approx 2500 boats/year at the average lock. N.B. Vessels numbers are not tracked, the number shown is lockages. Starting in 2009, the Canal will be keeping vessel statistics which will give information for each lock-station, and also the number of unique vessels on the system and the number of transits. Genuine transit accounts for less than 30% of this traffic Some Canadian boaters
Training	Customer services type training. This is tied to the Customer Satisfaction survey which is done bi-annually.

11.3 Relative confidence

The Corporation's director feels that there are enough stakeholders, and experienced and dedicated staff, and that these bodies – along with the users – will protect the waterway into the future.

They would like to be able to improve services, for example by extending the hours of operation, but do not have the resources to do so at this time.

They regret that they are having to put more pressure on the canal workforce as funds decline. The integrity of the infrastructure is being protected, but all the other tasks that need to be done would justify expansion, not contraction, of the workforce. Accordingly, it is estimated that the Corporation's mission is being achieved by about one third to one half, leaving many issues to be addressed. The infrastructure is ageing and development work is behind schedule, as are dredging and operations.

The reason for this is the minimal release of funding to the Corporation from the Thruway, which is keeping the system and its capital programme alive, but not to the level required from the engineering and management standpoint. Accordingly, it is felt that at some point in the future, the pivotal decision will have to be made: to stay with the Thruway or seek independence. This process could take anything between 2 and 20 years, depending on the legislature and legislators.

There is excellent institutional knowledge, and the canal has a highly skilled and dedicated workforce, but it is declining under pressure on annual funding. In 1978 there were 1500 people working on the canal, now there are only 520. This also has an impact on safety issues.

The Thruway is also affected by reduced toll revenues, as the economy enters the recession.

The manager remains confident with the decision-makers currently involved, but cannot predict the situation, say, 10 years from now. Survival is assured today, by the fact that the infrastructure is kept open, but there is uncertainty in the future. Confidence could be assessed at 90 % today (in 2009), but perhaps no more than 70 % for the year 2015.

11.4 Funding

a) Amount and delivery of public funding

The bulk of the expenditure summarised above is covered from the Thruway Authority's income (from tolls paid by vehicles on the Thruway). The amount is paid annually. The internal process is as follows: the Canal Corporation puts in its request at beginning of the year, the Thruway board decides the amount of funding to be released, and then the Canal Corporation has to stay within budget.

The Canal Development Commission approves a separate Canal Development budget, which calls on Thruway and Federal funds. This is the context in which new investments are delivered, for example on the ambitious trailway project which was announced in 2000 (for a total investment of **$50 M**).

Federal funding is a based on a percentage of what New York State receives from Washington. In application of a Memorandum of Understanding, this amount is an arbitrary 25% of what the Department of Transport receives from the Federal Highway Trust Fund. This varies from year to year, but on average it amounts to approximately **$6 M**.

It should be noted however that Federal funds are not available for operations or capital expenditure. They are for communities and projects, education and interpretation, marketing and tourism, and environmental improvements, all these expenditures being directly related to the Erie Canalway National Heritage Corridor Commission Master Plan.

By experience, the budget never grows year on year. Also, there can be further pressure when the final budget is lower than the amount originally approved, through refinements as the fiscal year progresses.

b) Possible improvements

If the Canal Corporation were a separate stand-alone agency, it would be able to set its own priorities. To date, it has always been directed on how to spend its money. It pays the Thruway for overheads and services they provide, including legal services and a proportion of management staff costs.

c) Decision-makers' relative understanding of the waterway's needs

The Canal has always been under the umbrella of some other organisation. The Corporation's current perception is that the Thruway understands more than the outside world, and has taken much better care of the canal than when it was part of the Department of Transport (of the State of New York). However, the 'care' is manifest more through the financial engineering than through a complete understanding of canal operation and management.

By way of illustration, the canal received $20 million from the Department of Transport in 1992. Following transfer to the Thruway, it received **$40 M** in the first year.

d) Operating revenue

Operating revenues account for a very small proportion of costs, 2.5% of costs on average over the 3 years analysed.

e) Political/funding risks

The Canal Corporation's director feels very strongly that they should be part of an organisation that is not tied to making money. The culture of the Thruway management is related to collecting tolls and spending the money on

hard-core highway engineering. Whatever the difficulties, it remains a relatively straightforward business model. Accordingly, it is felt that the Canal is not fully appreciated or understood. The Thruway is keeping the Canal alive (indeed, it is under a statutory obligation to keep the canal running), but is at present addressing basic maintenance requirements only. There is an urgent need for further funding, i.e. from Federal funds, since there is no funding from the State itself. The director's conviction is that the canal cannot continue to depend on the Thruway.

The complaint by users of the Thruway that they are subsidising the canal through their tolls could also be qualified as a funding risk, on account of the pressure which this lobby may bring to bear on State politicians. The counter-arguments put forward by the Canal Corporation are:

(a) toll-payers driving on the Thruway can access and enjoy the canal for only a minimal additional expense, if at all (for example, to visit historic or other canal sites, use the trail, picnic, go to a restaurant, etc),

(b) the cost accounts for only about 5% of the toll revenue.

11.5 Achievements/factors of success

Since 1996, millions of dollars have been spent each year to enhance and increase recreational use of the system.

Roughly two thirds of the recommendations contained in the *Future of Canals* report have been accomplished.

The renewed **commercial use** of the canal will help to ensure that it is kept open.

The **dredging programme**, although behind, has achieved more volume than in previous years. Winter dredging operations are proceeding (the last winter dredging was completed in 1983).

There has been progress in **real property** management, new trails, development of harbours (Pittsford, Lockport).

The winter maintenance programme is now in place throughout the length of the canal.

Improvements have been made to the infrastructure, the locks are safer and of better quality, and more pleasant to visit. New canoe and kayak launches have been built.

Environmental and water quality improvements have been made. Water quality is far superior to what it was. Communities are no longer turning their back on the waterway.

Winter events and programmes are organised on the land side, along with outreach programmes, coupled with signature events such as 'Canal Clean Sweep'. The number of canal events has increased from 40 (10 years ago) to 260 across the system. This success is partly the result of the Corporation's commitment to community revitalisation projects along the Canal System; canal communities are more involved and on board. The Corporation has developed and maintained more partnerships, thanks to painstaking efforts at all levels: federal, state, local, and volunteer sector.

List of major events in 2009 (from http://www.nyscanals.gov/exvac/special-events/index.html

11.6 Future management challenges/projects

The essential challenge today is to secure the canal's funding on a new basis. The report on the *Future of Canals* pointed to the issue. Since 1992, investments totalling **$575 M** have been made to the canal system during the Thruway's stewardship; however, the missions of the Canal Corporation and the Thruway Authority continue to diverge. The Canal Corporation depends on the finances and resources of the Thruway Authority. With the Executive Director and Board serving both organisations, priority projects for the canal fall within the larger needs of the Thruway Authority and are statutorily defined as secondary priorities.

The current model is therefore called into question, and the canal's owner, New York State, is looking at a new strategy which would establish more firmly the canal's vocation as a tourism resource and 'greenway'. An interagency task force published in 2005 a report recommending separation from the Thruway and creation of a stand-alone independent public corporation.

The 'Greenway' tourism-focused option is supported by those who want an enhanced public perception and greater independence as a multi-use asset for the State, and greater freedom to do commercial deals, but there seems to be some resistance from those who feel that the canal's days as a transport artery are not over, and that the logic of running the waterway as transport infrastructure, backed by the road infrastructure which secures surplus revenues, should prevail.

The State is being asked to grant the Corporation its independence, because the difference in culture between the Thruway (effectively a road toll collector) and the Canal Corporation (a money spender) creates misunderstandings and difficulties.

In addition, the current staff organisational matrix of the Canal Corporation was designed with the Canal System viewed exclusively as a transportation artery. The Canal Corporation was organised on the Thruway model, with three Division Offices headed by Canal Division Engineers across the State, responsible for seven sections and, until recently, four floating plants. The result has been a gradual yet inevitable shaping of three separate and distinctive Canal networks: the Buffalo Division network, the Syracuse Division network and the Albany Division network.

The Canal could stay with the Thruway, but it is felt that it should be part of a revenue stream where State agencies transfer a percentage of their budget resources specifically to the canal. Alternatively, it could become a separate agency. It is widely felt that this needs to be addressed in the short term, because in the meantime boat traffic is declining, and the road lobby (the American Automobile Association and road haulage companies) is complaining about the increases in tolls, which they believe could be avoided if the Thruway did not have to support the canal system.

11.7 Specific issues

a) Waterway tourism

Educational outreach is still a constant challenge, to bring the potential offered by the Erie Canal to the attention of the population. In New York City, for example, the canal means nothing to the vast majority of the population.

Outreach, trail, canal and landside all go hand in hand (see other comments above), and their viability depends on the waterway being open. Commercial use is appreciated, as it adds a series of additional reasons to run the canal, and to run it for as long a season as possible.

b) Water supply and flow management

This issue brings with it a serious threat. When built in its current configuration the canal was provided with the necessary water supply by the construction of dams; it effectively owns its water resources. Recently, during a very dry summer, the main reservoir had to be drawn down to keep the canal in water. Some people feel that the primacy of the canal should be called into question, claiming that more 'essential' water uses should have priority over navigation. The proponents of the legislative changes point to what they claim is the unreasonable drawdown of reservoirs during very dry periods. A court case is being heard on this issue. The canal's case is being defended, but the risk is real. (An illustration of this risk is the closure of the Canal du Midi in Southern France during the very dry summers of 1990 and 1991, forced by the farmers' community, on a matter of principle rather than the physical reality.)

c) Staff management

There is an issue of devolved or centralised power and authority. There are three divisions – western, central and eastern – each headed by a Chief Engineer who enjoys a degree of independence in managing his unit. This is certainly not unique to this canal, but is characteristic of all canals or waterways of some length, with divisions more or less remote from the headquarters. The Canal Corporation has recognised the communication difficulties this situation generates, and is working to overcome them. It is encouraging divisional staff to accept the concept (and the reality) that all are part of the same canal, and that all belong to a public agency providing service.

This points to a need for more interaction and communications between divisions, also between the divisions and headquarters.

Conclusions on funding and income profile

ADVANTAGES	*RISKS*
• Funds available from Thruway toll revenue • Federal contributions secured through designation as National Heritage Corridor (although not available for operating or capital expenditure on the canal itself) • Support from voluntary sector (Canal Society's work in promoting and designing heritage enhancement projects)	• Canal peripheral to main concerns of the Thruway Authority • Thruway's clients see expenditure on canal as a cost which they should not have to bear • Canal is costly to operate on account of its very large dimensions (width, depth and lock capacity) • Opposition to drawing down canal reservoirs in periods of drought (by riparians who have been permitted to build along reservoir shorelines)

12. Summary of findings from sample waterways

Our conclusions on the advantages and disadvantages of the different funding models analysed cannot point to any obvious model or solution to ensure sustainability. The way each waterway is funded is closely related to the history of ownership and management. It is striking that public funding still amounts to around 98 % in many cases.

Only the Göta Canal comes close to the UK model, where the canal's history as a commercial undertaking lives on under public ownership, and income is earned up to two thirds of the total expenditure.

The Canadian canals also earn revenue that is far from negligible.

The following table sets out the results for each waterway in the sample. This provides approximate equivalent values in GBP (2007 values except where otherwise indicated) of the respective expenditures/revenues for the countries concerned using the assumptions for exchange rates and inflation given in Appendix II.

Table summarising cost and revenue data for last available year converted into GBP (2007-2008)

Canal	equiv-alent km	Goods & services £ M	Staff costs £ M	Capital costs £ M	TOTAL £ M	Total per eq. km [1] £	Operating income £ per eq. km [2]	% coverage of costs by revenue
Rideau Canal, Parks Canada	187	0.84	2.43	1.09	4.36	23 300	3 100	*13.4*
Trent-Severn Waterway, Parks Canada	317	1.00	4.50	3.86	9.36	29 500	4 430	*15.0*
Canal de Roubaix (including canalised river Marque) [3]	44	0.29	0.61	0.09	0.99	22 500	4 100	*18.2*
River Lot (via two *départements*)	191	0.17	0.68	0.85	1.70	8 900	370 [4]	*4.2*
Brittany Canals (Morbihan *département*)	339	0.88	1.71	1.51	4.10	12 100	470	*3.9*
Canal de l'Espierres [3]	14	0.07	0.13	0.07	0.27	19 300	410	*2.1*
Recreational Federal waterways of Eastern Germany [5]	677	4.09	11.00	12.06	27.15	40 100	210	*0.5*
Finow Kanal [5]	44	0.32	1.85	0.35	2.52	57 200	330	*0.6*
Spreewald canals	1 357	n/a	n/a	n/a	n/a			
Shannon-Erne Waterway	69	0.42	0.77	0.04	1.23	17 800	310	*1.7*
Drenthe Canals	195	0.49	1.32	0.28	2.09	10 700	180	*1.7*
Göta Canal	219	0.61	0.42	3.59	4.62	21 100	13 940	*66.1*
Erie Canal (New York State Canal Corporation) [6]	791	27.40		21.17	48.57	61 400	1 210	*2.0*

1 rounded off to nearest £100
2 rounded off to nearest £10
3 reference situation before rehabilitation, at today's values
4 income perceived by State, not the effective waterway authorities (Conseils Généraux of the *départements*)
5 figures for the year 2005 were taken for these waterways, on account of the exceptional level of investments in 2006 and 2007 which would have distorted the result
6 taking average costs over 3 years 2005-2007, on account of the substantial year-on-year variations in the capital budget. N.B. a single figure is given under operating and maintenance and staff costs, which were not broken down in the data supplied.

a) Political motivation supported by perceived socio-economic benefits

Funding is ultimately a question of political motivation, whatever the level of authority. Financial motivation applies only where the private sector is allowed to develop its own components of the waterway's overall business model.

The public sector has historically always been asked to implement the preliminary investments required to create a favourable climate for private investors. This remains true today.

Since the financial burden of inland waterway maintenance and operation remains firmly in the public sector, the crucial question is how politicians perceive the overall benefits delivered by the waterways, which then determines the sustainability of the financial effort that involves.

Our research shows that a change in perception of these benefits, and a possible reduction in budgets allocated, is a risk faced across the board, in all categories of management described in the Introduction (chapter 3).

b) Investment often preferred to involvement in governance

The risk affects not only the initial investments where applicable (including capital works to make up for a maintenance backlog), but also the annual costs of operation and maintenance.

Some politicians see benefits in the initial investment, because of the impacts of implementation of the project as such, while refusing to assume responsibility for operation and maintenance at the level of their regional or local authority.

The model for the River Lot seemed very promising in 1992, when Government funding under 'regional development' was secured for more than **€120 million**, but as our research reveals, even where a rolling investment programme has been negotiated, there is no automatic release of funds year by year.

This envelope for the River Lot was simply an allocation, while each project was then to be submitted for actual approval and programming. This has even given rise to competition between neighbouring *départements* for the available funds.

c) The importance of land-based visitors in the assessment of benefits

Overall, however, the situation of the waterways as drivers of tourism and economic multipliers in local development has improved greatly over the past 20-25 years, throughout the sample waterways. Party politics can still play their role in political motivation, and special-interest lobbies such as the angling federations and environmental groups can still call into question ongoing maintenance of engineered inland waterways, but the negative view of recreational use of inland navigations as being an elitist activity has declined significantly, as studies have repeatedly pointed to the wider benefits generated by the waterways as living heritage.

Cycling, walking and other land-side activities are now adding their weight in numbers, hence also in the political debate on funding challenges or opportunities.

d) Transfers of ownership to regional or local level - political opportunism or an option for improved governance?

The report draws attention to the issues currently being debated in France and Germany. It shows how the process of transfer of ownership to a regional authority can be extremely long. The 6-year trial period currently effective between the State and Burgundy Region in France is short compared to the 30 years of compensating funding granted by law in the Netherlands (and applicable to the main route through Drenthe Province).

e) State withdrawal can leave local authorities ill-equipped to take on the responsibility

In short, regional/local authorities are not generally equipped to run such complex infrastructure, and will only agree to take on responsibility if they are given guarantees of continued support from the national level, not only for funding, but also because the engineers, technicians and operating staff who know how to run this infrastructure are in many cases only available at the national level.

Furthermore, regionalisation or transfer to authorities at a more local level can introduce an element of uncertainty related to the loss of integration, and the risk is all the greater the more local the level of transferred ownership or authority.

National waterway networks, as long as they are held together under a single ministerial portfolio, have continued to enjoy a minimum level of security and sustainability thanks to the perception of the network as a whole. As in national railway networks, the busiest and most profitable sections could help to fund the remoter and less used parts of the network. With regionalisation, this factor no longer applies, and neighbouring regions, *Länder*, counties or *départements* may well have completely different perceptions of the benefits of maintaining each portion of the network.

The way these high-level issues of transfer of national waterways are resolved will give a valuable insight into how recreational waterways may be funded in the future.

Appendix I - Glossary

AAVL	Association pour l'Aménagement de la Vallée du Lot, Association for Development of the River Lot Valley, founded 1969 (570 communes)
Aménagement du territoire	(French) spatial development (or regional development)
AMI	Appel à Manifestation d'Intérêt, call for manifestations of interest
BW	British Waterways
Comité des canaux bretons et voies navigables de l'Ouest	Committee for preservation of the Brittany canals and inland waterways of western France (based in Pontivy)
Conseil Général (Conseils Généraux)	Council(s) for the *département(s)*
DDE	Direction Départementale de l'Equipement, public works agency for each *département*
Département	(French) administrative unit at 'county' level; in Brittany and the Lot Valley, the *départements* have formed institutions to share management of their waterways, or at least some common management functions such as lobbying, fund-raising and marketing
DVMKM	(Dutch) Drentsche Veen- en Middenkanaal Maatschappij, the Drenthe Peat and Central Canal Company (in late 19th century)
Établissement Public Territorial de Bassin (EBTP)	(French) public agency coordinating measures over a specific catchment area
EdF	Électricité de France, the national energy supplier
EIBL	Entente Interdépartementale du Bassin du Lot, the river Lot agency formed by the five *départements*
Entente	Cooperation agency representing two or more *départements* or regions
Équipement	(French) public works
ESB	(Ireland) Electricity Supply Board
FNSE	(French) Fonds National de Solidarité pour l'Eau, National Fund for Solidarity in Water
GDP	Gross Domestic Product
Gewässerunterhaltungsverband	Local Water Management Board (Brandenburg)
Gîte	Self-catering overnight accommodation in rural areas
IAV	Institut pour l'Aménagement de la Vilaine
ICIRMON	Institution du Canal d'Ille-et-Rance Manche Océan Nord
INTERREG	EU-funded interregional cooperation programmes. INTERREG IV covers the period 2009-2013
Investeringsbudget Landelijk Gebied	(Dutch) regional development fund
Kreis	German local district council
Land (plural 'Länder')	Region in Germany, each with its own government and a wide range of responsibilities, including transport, public works, 'Raumordnung' (*q.v.*) and the environment
Liaison Manche-Océan	Generic name for the inland waterway route from the English Channel to the Atlantic
MET	Ministère Wallon de l'Equipement et des Transports (predecessor of the Wallonia Public Services Department, see under SPW)
Office National des Forêts	(France) National Forestry Board
PPP	Public Private Partnership
Préfet	(French) Prefect, or head of government office at level of *département* or region
Raumordnung	(German) Spatial development (or regional development)
Rijkswaterstaat	(Dutch) State Water Conservancy (owns and operates State waterway network)
Service du Borinage	Borinage district waterway office (under Ministry of Communications prior to regionalisation in Belgium), now replaced by 'Tournai waterway office')
SMATAH	Syndicat Mixte d'Aménagement Touristique de l'Aulne et de l'Hyères, institution managing the isolated western portion of the Nantes-Brest Canal in Brittany
SPW	Service Public de Wallonie, the regional ministry of public works and services
Stichting Recreatietoervaart Nederland (SRN)	Netherlands Recreational Waterways Foundation
Syndicat Mixte	Public body representing 'mixed' levels of local authority, e.g. *départements* and
VNF	Voies Navigables de France, the French national waterway authority (since 1991)
Wasser- und Schifffahrtsverwaltung (WSV) Ost	Waterway and navigation directorate for Eastern Germany (under Ministry of Transport)
Wasserstraße	(German) inland waterway
WIN	(Brandenburg and Mecklenburg-Vorpommern) Waterways Tourism Initiative

Appendix II - Currency conversion factors

Conversion factors for currency into GBP (2008), for summary data in chapter 12, are as follows:

	2006	2007	2008
Canada	0.512	0.472	0.495
France/Belgium	0.721	0.705	0.796
Germany	0.721	0.705	0.796
Ireland	0.721	0.705	0.796
Netherland	0.724	0.696	0.734
Sweden	0.0780	0.0763	0.0828
USA	0.574	0.515	0.545

Data sources and assumptions:
(1) Average of daily interbank ask rates for currency into GBP for UK financial years, as follows:
2006 = 2005/06 2007 = 2006/07 2008 = 2007/08
except for Canada and Netherlands: from 1 July to 30 June
www.oanda.com/convert/fxhistory
(2) UK GDP deflator for UK financial years as follows:
2006 = 2005/06 2007 = 2006/07 2008 = 2007/08 = 100
www.hm-treasury.gov.uk/data_gdp_fig.hmt

Appendix III – Process

Rideau Canal

Interviews were conducted in person and by telephone with the Gord Giffin, Superintendent, and Irv Mazurkiewicz, Director of Operations. The financial data (budgets, expenditures, revenue) was provided or confirmed by Michel Belanger, the Manager of Finance along with Mark Brus, canal accountant, and traffic information was confirmed and/or provided by Mary Ann Steinberg, Visitor Services Officer.

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Trent-Severn Waterway

Interviews were conducted with Mike Jamieson, Acting Director of Operations, Trent-Severn Waterway, who provided data on revenue, boat traffic and visitors, Peter Frood, Superintendent of the Central Ontario Field Unit and the Trent-Severn Waterway National Historic Site. Dwight Blyth, Manager of Finance and Administration, provided financial data on the waterway. In addition, Wayne Mitchell, former manager of realty services for the waterway, provided data contained in the overview of the waterway.

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Canal de Roubaix

David Edwards-May is in regular contact with the all the partners of the current 'Blue Links' restoration programme. Key players interviewed were Slimane Tir, vice-president of Lille Métropole Communauté Urbaine, in charge of Parks and Public Open Space, Sophie Fourny and Arnaud Poëtte in the Environment and Quality of Life Department, LMCU, several representatives of VNF (new works and Lille subdivision).

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Canal de l'Espierres

David Edwards-May is in regular contact with the all the partners of the current 'Blue Links' restoration programme. The specific interview for the study was with Marc Hospied, Service Public de Wallonie
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Erie Canal

Tom Grasso and Dave Ballinger of The Canals Group interviewed Carmella Mantello, director of the New York State Canal Corporation, who was accompanied by Chief Engineer Larry Frame.
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Appendix IV - Terms of reference

The research to be undertaken for each example was defined in the Terms of Reference as follows :

a) provide a **brief description** of the ownership arrangements and operating characteristics of the concerned waterways in the 8 countries;

b) research the current public and private **funding/income sources** for the operation and ongoing maintenance of the listed inland waterways; distinguishing between income generated by, or otherwise internal to, the waterways and any external funding such as in the form of equity, loans and grants; assembling relevant summary financial data for the 3 most recent years if available;

c) determine the **type and proportion of funding sources** for each listed waterway, including but not necessarily limited to:
   – government (local, regional, national, supranational),
   – other public source (such as lottery funding),
   – waterway licences, permits and tolls (direct from waterway or indirect via road/rail),
   – land/property rental and/or development,
   – other private or commercial sources.
   – contributions from the voluntary sector;

d) appraise the **advantages and disadvantages** of the funding arrangements in the context of the ownership arrangements and operating characteristics of the waterway concerned;

e) research any planned and significant future changes to the source of funding or the balance of such funding within each country, with the reasons for such changes;

f) produce a **concise final report**, with an executive summary, outlining the findings for each listed waterway.

Appendix V - Conclusions on funding and income profile per waterway

Rideau Canal and Trent-Severn Waterway, Canada

ADVANTAGES	*RISKS*
• The Federal Government is obliged to secure funding to maintain National Heritage sites	• Due to development pressures and other water requirements, the primacy of navigation is being questioned.

Roubaix Canal, France

ADVANTAGES	*RISKS*
• The canal today has a minimum annual income from a licence for fibre optics cable under the towpath.	• No designated owner to take over from the State (through VNF) • Perception of canal infrastructure as being too costly to operate and maintain for limited use by boats • Vandalism • Perception of navigation as being a much lower priority than (for example) public transport at movable bridges

River Lot Navigation, France

ADVANTAGES	*RISKS*
• Each *département* manages the funding of its length of the waterway at its discretion, according to its tourism development strategy • The *Entente* ensures effective lobbying at the national and European level, and common marketing; substantial EU and State funding was thus secured • The indirect economic impacts of restoration to navigation have been well researched and are perceptible to all the population, hence support overall for expenditure from local taxes	• EU funding no longer available for ongoing investments • Investments remaining to be completed for full restoration judged prohibitively expensive and environmentally unsound • Conflict between requirements of inland navigation and peak hydropower production • Disparate management criteria and methods • Limited resources avauilable to the *Entente* as coordinating body • Lack of transparency in management of navigation and unwillingness of engineers in each *département* to supply data

Brittany Canals, France

ADVANTAGES	*RISKS*
• Transfer of ownership from the State to the Region places strategic development in the hands of a single authority with full powers to intervene and ensure equitable funding over the entire network	• No clear definition of the assets and liabilities of the network (subject of a study to be conducted in 2009) • Transfer not formally completed until Region has analysed the results of this study and made a possible submission to the Government for arrangements and compensation (e.g. regarding personnel) • Disparate local management bodies with different statutes • No licensing or other income from boats or boat hire firms

Espierres Canal, Belgium

ADVANTAGES	RISKS
• Integrated management of mixed-use waterways as transport infrastructure is part of core strategies of both Wallonia and Flanders; both are proactive in including smaller recreational waterways	• Espierres Canal is peripheral • Lower priority than the Wallonia's high-capacity waterways (e.g. for dredging) • Minister has been reluctant to approve works

Brandenburg waterways, Germany

case A – Federal waterways

ADVANTAGES	RISKS
• Federal funds made available to fund the recreational waterways • Unified management of network for recreational boaters	• Funding source intrinsically unsustainable, since a reform is being actively promoted (current 'inherited' situation is the result of inertia following reunification in 1990) • No operating income from non-navigation functions • Very marginal income from boats (lump-sum licence paid by the Federations)

case B – Regional (*Land*) waterways

• The Region measures the benefits of waterway tourism for local economic development and employment, hence the ongoing investment programme • Long-established experience of running its own waterways provides a basis on which to build the future governance of the recreational waterway network as an entity	• Region may not be willing to spend as much on the canals from regional taxes as the Federal Government has traditionally paid from the national transport budget • Environmental lobby blocking investments to make certain waterways navigable in powered craft • No licensing or other income from boats or boat hire firms

Shannon-Erne Waterway, Ireland

ADVANTAGES	RISKS
• Binding intergovernmental agreement on maintenance and operation of the waterway network throughout the island • Investments continuing with the Ulster Canal underline the force of this agreement • Benefits of waterway tourism are perceived on both sides of the border	• Different policies may emerge North and South, which could call into question the terms of the agreement, OR ongoing investments

Drenthe canals, Netherlands

ADVANTAGES	RISKS
• Integrated management of the whole network by the Provincial government • Integration of canals into the transport infrastructure network with roads means rationalisation and cost savings	• Drenthe Tourism has gone into liquidation, creating an unstable environment for tourism development • Province has relatively few attractions for tourism • Canals are relatively costly to operate on account of the numerous movable bridges • Certain canals may be closed or their season shortened, or whatever other measure may be determined at the political level in the province, to cut costs

Göta Canal, Sweden

ADVANTAGES	RISKS
• Financial stability historically ensured by the private canal company's investments and management, 'inherited' by the State • Operating income from estates, private boats and trip boats covers 60% of expenditure • National monument status	• Short operating season • Pressure to reduce cost of licences for boat passage

Erie and Champlain Canals, USA

ADVANTAGES	RISKS
• Funds available from Thruway toll revenue • Federal contributions secured through designation as National Heritage Corridor • Support from voluntary sector (Canal Society's work in promoting and designing heritage enhancement projects)	• Canal peripheral to main concerns of the Thruway Authority • Thruway's clients see expenditure on canal as a cost which they should not have to bear • Canal is costly to operate on account of its very large dimensions

Illustrations

Front cover:

– *Dredging the canalised river Marque, part of the Roubaix Canal, at Marcq-en-Barœul* © David Edwards-May

– *Recreational boating on the Espierres Canal below Leers lock (near the French border)* © Lille Métropole Communauté Urbaine

– *Villeneuve lock on the river Lot, completed in 2005 to bypass the 13m high dam built by Électricité de France* © Fran Babiss

Back cover:

– *The Ems-Jade Canal at Upschort Lock (one of the smaller canals in East Friesland, Germany, now maintained only for recreational traffic).* © Andreas Kuhlmann

– *Big Chute Marine Railway on the Trent-Severn Waterway, Canada* © Parks Canada

– *Working a lock on the restored length of the Apeldoorn Canal, Netherlands* © SRN

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