





The 7 Most Endangered 2016

Programme run by **Europa Nostra**, the Voice of Cultural Heritage in Europe, in partnership with the **European Investment Bank Institute**

Pont Colbert (Colbert Bridge), Dieppe, France

Report

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1. Summary

The Pont Colbert (Colbert Bridge) in Dieppe was built as a swing bridge to provide a pedestrian and vehicular link across a 40 metre wide canal which was being constructed to allow merchant shipping to enter a new set of quays and basins. On completion, the bridge restored links between the Pollet district and the city centre, while being able to swing to one side to allow ships to pass through the canal. At the time, the bridge was a technology demonstrator, with its steel construction, structural design and hydraulic technology. From its completion in 1888 until being disabled by enemy action in 1944, it operated continuously and reliably. Repairs were completed in 1946 and it has now operated at the same levels of availability and reliability for a further seventy years. This is despite periods of neglect, including the lack of any corrosion proofing for the last fifteen years.

The bridge is not yet a designated monument, but it sits at the heart of a conservation area and, for the local population, is more than just a physical bridge. It is a bridge to the city's history, tying social and cultural history to its economic history, whilst being a fully functioning piece of economic infrastructure. The bridge was built to enable a major expansion of port's capacity when it served the fishing, ferry and mercantile marine sectors. Over the years, these have changed drastically. The fishing industry has split into artisanal and large scale, while ferries have changed from small ships to large vessels. Merchantmen grew in importance but are now in possibly terminal decline, while pleasure craft have multiplied. Critical questions are therefore whether the Pont Colbert represents a barrier to the structural changes taking place within the port, and whether it can balance the needs of both the port and the local population.

The port operator, the *Syndicat Mixte du Port de Dieppe* (SMPD), which owns and operates the bridge, asserts that a new bridge is essential for the future development of the port. However, it has not published any quantitative or qualitative analysis to support this suggestion. The presented arguments are that a) a new bridge would operate more quickly and b) that a new bridge could be operated remotely from a control room with better control and lower operating costs through labour savings. In practice, even if a new bridge could be made to swing substantially faster, say halving the opening and closing times, there would not be a significant time saving over the full operating cycle. Larger merchant vessels, for which the time saving might represent a significant economic benefit, are the vessels which take the longest time to pass. For them, the swing time makes little difference. The benefits to small vessels would be greater, but many of these are leisure and pleasure craft for which the economic argument is much weaker. For them, the impact could be minimised by better planning if the existing bridge were to be retained. A proper analysis of the bridge's usage and users, e.g. pedestrians, vehicles, small leisure craft and large merchant ships, to identify the most appropriate schedule of bridge opening would almost certainly offer greater economic benefits than making capital investments in a faster bridge.

None of the affected public administrations: the City, the District, the Department, the Region, nor the bridge's owners were party to the "Seven Most Endangered" nomination. However, a group of interested





individuals and organisations: the "Review Group", attended meetings on 31 May and 01 and 02 June 2016 in Dieppe and Paris with many of these parties. The objective of this report is therefore limited to identifying a potential plan of action for the Review Group and assessing the conditions necessary to allow this to be put into effect.

There are three elements to the plan of action:

<u>Firstly</u>, a proposal for the award of National Monument status should be submitted to the relevant committee at the earliest possible date.

<u>Secondly</u>, the SMPD's shareholders should be lobbied to give an undertaking that neither the SMPD, nor any follow on-organisation, will take any action which might prejudice the Pont Colbert's future while deliberation on its status as a National Monument is under way.

<u>Thirdly</u>, the shareholders should also be asked ensure that no decision is taken without an appropriate Cost Benefit Analysis by independent advisers, using an appropriate methodology, and with access to all operating data and operational costs.

2. Purpose, location

The objective is to ensure the continued existence and functioning of the Pont Colbert (Colbert Bridge) in Dieppe, *Département de Seine-Maritime*, Normandy, France.

The bridge lies within the Pollet district of the town, which is a conservation area, and was built as a swing bridge to allow ships to pass along a newly constructed canal in 1889. The bridge was required to restore communications both within the Pollet district and between the road system to the East of the city and the city centre.

3. Context

In 1880, a major programme of development works was launched to expand the port facilities of the city of Dieppe. This required a canal to be driven through the Pollet district to link the main harbour entrance to an area of low-lying land, which was further excavated to create two extensive basins. These were to be lined with quays and warehousing to handle merchant ships and their cargoes. The plans also included marine maintenance and repair facilities, incorporating a dry-dock. Following the existing alignment of the district's roads, the Pont Colbert was built as a swing bridge to allow ships to pass, while restoring communications both within the Pollet district and between the road system to the East of the city and the city centre. It is worth noting that the Pollet district is designated as a Category 4 conservation area under the *Zone de Protection du Patrimoine Architectural Urbain et Paysager* legislation. The bridge spans a 40 meters wide canal and carries a two-lane roadway, with two pedestrian walkways cantilevered on the outside of the main structure, one on each side at roadway level. See Appendix 2 for images of the bridge. The bridge was commissioned in 1889 and, except for a short period in the 1940's when it was being repaired following enemy action, it **has operated continuously for nearly 130 years with a very high**





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degree of past and continuing reliability. Apart from the limited repairs needed following the sabotage attack, the substitution of electricity for the original steam power, and the replacement of the original wooden road surface by metal grills, the bridge has the same configuration as it had when it was built. The *"Pontier"* (bridge-hand) who operated the bridge on the opening day would be able to walk straight into the control cabin and operate the bridge today.

The focus of most cross-channel passenger and freight travel is now the short crossing routes, e.g. Calais-Dover and the Channel Tunnel. However, Dieppe has a long history as a transit point, being on the most direct line between London and Paris. It also has a long history as a mercantile and fishing port in its own right. Dieppe was originally established at a break in the chalk cliffs which frame the city, with a defensible position and access to the sea. By the middle of the 19th Century a harbour system had been developed which followed a tidal waterway. At that point, the decision was made to create new tidal and non-tidal basins to increase the port's capacity and diversify the facilities offered. The topography was such that new basins could be created to the North-East of the existing quays by driving a canal through a district of the city at a bend in the waterway into an area of low-lying land, effectively creating a new peninsula. Merchant shipping, and ships and boats requiring dry-docking, other repair facilities and hard-standing, would use the canal to access the new quays and shipyard facilities, while the new cut would be spanned by a swingbridge: the "Pont Colbert".

Today, while Dieppe is a less important port than some of its regional neighbours, e.g. Le Havre, it still has significant mercantile marine activities, and comprises four operating zones:

- A ferry terminal and aggregate processing facility. This sits at the harbour mouth on the East side of the channel. The ferry terminal offers three return ferry sailings daily (two in winter) to Newhaven in the UK, operated by DFDS, with a sailing time of four hours.
- A marina for pleasure craft inside the harbour to the West of the main channel. This offers 410 berths, of which 50 are reserved for visitors. In addition to the main marina area, which is tidal and operable at all states of the tide, there are a further 120 berths in two non-tidal basins, protected by lock gates, one of which is accessed via the channel spanned by the Pont Colbert. Finally, also accessed via the Pont Colbert channel and operable at all states of the tide, is a small-craft rack storage system built in the now disused dry-dock with a robotised pick-and-place system. This has a capacity of 292 motor boats of up to 7.4 metres length overall.
- A fisheries zone on the East of the main channel and also in the non-tidal basins. This is a home port to some 80 vessels: split between large industrial boats, mainly trawlers and scallop dredgers, and small boats; typically working lines and pots. These are supported by on-shore processing and market facilities. A recent development for small-scale, typically family, fishermen is a covered quayside market for direct sales to the public.
- A commercial port, with tidal and non-tidal basins, accessed via the Pont Colbert channel. In the past Dieppe was not only a general port, but was also a main point of entry for bulk shipments of bananas. The structure of that trade has changed over the last ten years, and the large-scale storage and





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transhipment buildings are now redundant. The Port is seeking to revitalise the merchant trade and, at the time of the visit, the docksides were home to a large number of aerogenerator (windmill) blades and towers awaiting transhipment. However, the future of the commercial port facilities as a mercantile marine platform, rather than as an industrial or commercial trading estate, is uncertain.

As well as generating its own traffic, the port system has an impact on traffic flows within the larger conurbation. The port effectively splits the Eastern part of the city from the main centre and West. Local traffic, both vehicular and pedestrian, normally crosses both the Pont Colbert and a bascule bridge, or has to go around the whole port system. Heavy freight traffic does not use either bridge: most of the usage is light vehicular and pedestrian. The main road to the East of the bridge is single carriageway of limited width with one lane in each direction and narrow pavements. The side roads are narrower. When the bridge is open to shipping, it represents a significant barrier to pedestrians, who are effectively cut off from the main city centre.

As freight shipment patterns have changed, the conventional port facilities have reduced in economic importance. Dieppe no longer handles bulk cargoes and has never had a dedicated container terminal. Its total freight movements in 2015, down on 2014, represented approximately 3% of the freight tonnage at neighbouring Le Havre. As a city, Dieppe is the poorest in the region and has the highest levels of unemployment.

While the Port is an important contributor to the local economy, many of its traditional activities are in decline and it is increasingly dependent on the ferry terminal for growth.

The Port is controlled by a not-for-profit company whose shares are held by the Region of Normandy (73%), the *Department* of Seine-Maritime (15%), Greater Dieppe-Maritime (8%), and the City of Dieppe (4%). All shareholders are represented on the governing body. The Port is reported to be operating below its budgeted revenues but, at the same time, there are extensive waiting lists for pontoon berths for leisure craft. The financial rationale of the Port's operations is not clear. It is providing commercial services to individuals and private sector operators, but capital expenditure is dependent on grant-aid and budgetary funds from the shareholders. This implies a subsidy to private sector operators and private individuals, in the absence of any published economic data to the contrary.

Finally, although the bridge is owned by the port, and its costs are carried by the port, it does not form part of the port's road infrastructure, except where port staff and clients use it to get from one part of the port to another. It is, in practice, an integral part of the municipal road infrastructure, but controlled by an organisation which is at arms-length from the city's needs.

Apart from the port, one of the main contributors to the local economy is tourism. This business is highly seasonal - but is a combination of beach and cultural tourism

The multi-year plan (2015 - 2020) of the Port Manager: SMPD (*Syndicat Mixte du Port du Dieppe*), calls for the existing bridge to be replaced by a new swing bridge, placing the current bridge at obvious risk. It is contended that: the physical condition of the Pont Colbert has been incorrectly presented to the public and governing authorities, that the operational advantages of a new bridge







have been overstated, and that the use of public funds has not been justified by any form of economic analysis¹.

4. Description

The Pont Colbert is a single-sided swing bridge. While in its normal, "closed" operating position, i.e. with the canal closed, it is a simply supported beam resting on pads on each side of the canal. As soon as the bridge starts the opening process it becomes a balanced cantilever thanks to ballast placed behind the pivot on the "short" end of the bridge.

The opening procedure is as follows:

- Close the bridge to vehicular and pedestrian traffic;
- Raise the bridge slightly on its pivot and displace the support pads from under the pivot end of the bridge using a hydraulic actuator;
- Lower the bridge until a set of wheels under the frame of the bridge land on a circular rail and allow the bridge to rest on these wheels;
- Using a chain and pulley system to transfer the linear movement of two hydraulic actuators (rams) into rotational movement, swing the bridge on its pivot through a quarter turn to leave the canal fully open (See also Appendix 2);
- Repeat the previous step in reverse to bring the bridge back into its closed position;
- Raise the bridge on the central pivot and reposition the support pads using the same hydraulic actuator;
- Lower the bridge onto its support pads;
- Open the bridge to vehicular and pedestrian traffic.

The bridge may be split into four major components: the central pivot, the bridge structure, the hydraulic actuation system and the hydraulic control system.

<u>The Central Pivot</u>: During the opening and closing phases of the bridge, this carries all vertical, horizontal and moment forces arising from: any imbalance in the self-weight of the bridge, windage, and dynamic loads. The pivot also has to permit a limited degree of vertical movement and some 90° of rotation. Arguably, this is the critical component of the bridge as any excess movement ("sag" or "rock"), in the longitudinal vertical plane of the bridge will prevent the free end of the bridge "landing" on its supports on the other side of the canal during closing or create dragging during opening. The central Pivot can be split

¹ The term "economic analysis" is here used *sensu stricto* to mean an analysis of the tangible and intangible, financial and non-financial, costs and benefits associated both with the proposed project and with valid, viable alternative solutions.





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into two elements: the foundations which support the bridge and the mechanical components which permit the bridge's movement. Of these, the most critical is the foundation structure - the other being accessible, maintainable and repairable. SMPD documentation claims that there is evidence of instability in the foundations. If this were to be true, and the instability significant, it would require extensive and expensive works to rectify it. However, **an independent survey did not reveal evidence of instability or significant movement in the foundations**. The fact that the bridge continues to operate to its original specification with no problems during the initial opening or final closing phases of operation would subjectively suggest that the underlying structures are still sound. It might also be supposed that if there was any evidence of instability in such a critical area that any movement would be monitored closely. However, this does not appear to be the case.

There is evidence of movement: internal subsidence, in the body of many of the quays in the area of the bridge, but there is little movement in the facing stonework in the area of the bridge foundations and no evidence that the general subsidence of the quays has created any instability in the bridge.

<u>The Bridge Structure</u>: The bridge structure is a riveted bowed truss cantilever in puddled steel with a combination of rolled and flat section components. A comparison with other bridges would suggest that there is a high degree of redundancy in the structure. This is confirmed by an analysis by the SNCF (Société Nationale des Chemins de fer Français), which suggests that, **despite the lack of appropriate maintenance and corrosion prevention measures, the bridge is still structurally sound, with an expected life of 70 years**, subject to a suitable programme of maintenance and repair.

However, visually the structure is in poor condition (See Appendix 2). There is evidence of corrosion at the joints of subsidiary braces etc., and some of the minor diagonal braces have rotted completely. There is no reason why this should have happened and is the result of either negligence or deliberate neglect. There is no evidence of the bridge having received any corrosion prevention treatment or simple painting within the last fifteen years.

It is worth noting, in passing, that the "new", post-war, control cabin, which has seen repainting, is in structurally worse condition than the bridge.

<u>The Hydraulic System</u>: **The hydraulic system and associated mechanical linkages and drive systems are fully operational**. The technology was state-of-the-art in the second half of the 19th century - and is a true hydraulic system, as opposed the oleo systems now referred to as "hydraulic". The original motive force came from a steam driven compressor which built up a reservoir of pressurised water in an accumulator. The original steam driven system upstream of the accumulator has been replaced by electrically driven compressors, with a back-up generator. However, with the exception of some pipework changes and the replacement and relocation of the control cabin, the system from the compressors forward is all original, including the accumulator, the actuators to lift the bridge, the actuators to operate the pad systems and the actuators to rotate the bridge. The routine maintenance of these items is carried out inhouse and the system has a very high availability record with very few operational failures. The existing







actuators are in good repair and the skills and materials needed to replace any component which might suffer a catastrophic failure would be readily available from contractors to the water, oil, and gas industries.

The system has two operational levels. Under normal conditions, the systems operate at a pressure of 25 bar (atmospheres), with a pressure of 50 bar available, usually to combat adverse wind conditions.

<u>The Control System</u>: Strictly speaking, apart from a simple system to maintain the pressure in the accumulator, there is no control system. All hydraulics are operated manually by an experienced *Pontier* in the control cabin, with two additional *Pontiers* to maintain public safety and support the system operator. The sequencing of the operations is manual and normally requires expertise but not skill. However, in adverse weather conditions, or if one of the components of the hydraulic system is under-performing, then a degree of skill and experience is essential.

5. Technical and economic aspects

As should be clear from the previous section, the bridge is fully operational: and only requires to be repaired and maintained in line with good engineering practice for it to have an operating life of at least two generations.

There are, however, four aspects of the bridge which militate in favour of a replacement:

- 1. A new bridge would, for the first ten or twenty years, require less maintenance. This is, however, a short run benefit and in the longer term there would be little advantage. The Forth Rail Bridge, in the U.K., of a similar age, has recently undergone a renovation using the latest paint technology which is expected to have a working life of at least 25 years. The application and use of this type of technology was not a barrier to its cultural heritage status, and in 2015 it was designated a World Heritage Site.
- 2. A new bridge would meet all current standards for road bridges, particularly in respect of carriage way width, pedestrian footpath width and vertical clearance. Against this, it should be noted that a) these regulations are not applied retrospectively and very few existing bridges satisfy these criteria, b) the nature of the criteria mean that any new bridge will need to be significantly bigger than the existing bridge and will therefore have a significantly greater visual impact, c) the road network has been designed such that large, mainly commercial, vehicles and through-traffic are directed away from city centre, and d) employing new resources to replace an economic asset which is meeting its functional requirements would normally be seen as economically unsound, even before intangible economic benefits are taken into consideration.
- 3. A new bridge could have a shorter operating cycle than the existing bridge. This begs three questions: how much time would be saved, how much is this saving worth and to whom, and is this significant? During meetings with the SMPD, the impression was given that the justification for a new bridge was based on the needs of the SMPD, i.e. the needs of the port's marine activities. On that basis, the use of the bridge by marine craft can be split into three broad categories







- a) long duration openings for the transit of merchant ships. In this case, a new bridge might save circa 5% of the cycle time. This is probably lower than the variability of transit time between repeat visits by the same vessel.
- b) short duration openings for the transit of small commercial vessels. The savings here would be greater, possibly as much as 20%. This would represent a financial and economic benefit to the commercial vessel, but the degree to which the economic benefits would accrue to the local population is uncertain. There would certainly be only limited benefits to the SMPD and its shareholders.
- c) short duration openings for the transit of leisure craft. Any savings here would only accrue to the owner of the boat, with the only economic benefit being an intangible, and difficult to quantify, benefit in terms of the port being an attractive place to moor a private vessel. In this case, it is worth noting that there is a five year waiting list for marina places in Dieppe, suggesting increased attractiveness to the market need not carry a significant weighting.

When considering the cycle time for short openings, the time taken for traffic, particularly pedestrian traffic, to clear the bridge becomes important, particularly for the very young and elderly, which is similar to the time taken to open the bridge. This extends the cycle time significantly for short openings, and is independent of the bridge's swing time.

4. A new bridge could be more readily adapted to include remote operation. It is a pattern of the port industry, being actively promoted in the region, for port infrastructure to be operated and controlled remotely via data and video links. The SMPD is in the process of commissioning a new control room which will allow the remote control of locks, other bridges, passenger and freight bridges, etc. from their Head Office in the port. This was planned for completion in 2015 but was not operational at the time of the site visit in June 2016. Ultimately, control of this equipment is likely to be passed to a far distant control centre for the region. However, while it is always more cost-effective to integrate control systems at the design stage, there is no technical reason why even the 19th Century hydraulic system could not be retro-fitted with remote sensing and control equipment. The tolerances might be challenging for the designers - in the opposite direction to what they are used to - and the equipment might need to be better protected from interference by the general public, but it is certainly feasible.

From meetings with the management of SMPD it is clear that there is a limited understanding of economic analysis. There has been no testing of the economic viability of a new bridge, and only a rudimentary analysis of the financial implications. The fact that there is funding available within a budget plan should not, in itself, be sufficient justification for capital expenditure. SMPD management has suggested that there would be significant savings through staff reductions. However, these savings do not appear to have been analysed in economic terms. Within the space available it would be difficult to create a structure which would provide a secure environment for pedestrians without having a significant visual impact in a conservation area. However, even if direct supervision could be avoided, economic benefits of circa



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 \in 200,000² per annum would need to be identified to justify a new bridge, before the positive economic impact of a National Monument being located in the city is taken into account.

It is strongly recommended that a proper Cost Benefit Analysis be carried out by independent advisers, based on a proven methodology as developed by the European Commission and others. The analysis should consider all viable scenarios but as a very minimum it should include the new bridge case and the refurbishment and upgrading of the Pont Colbert case. At least in theory, the possibility of no operational bridge should also be tested, with a lifting footbridge and a static Pont Colbert, with road traffic being diverted. The economic implications of all scenarios should be tested, taking into account all relevant costs and benefits. In particular, it should be recognised that a retained Pont Colbert, as a national monument, would offer wider economic benefits (See also §10. below).

6. Implementation

There will be disruption to pedestrian and vehicular traffic under all realistic scenarios, i.e. construction of a new bridge or rehabilitation of the Pont Colbert. A highly experienced engineering and fabrication firm has estimated that the rehabilitation option would require a closure of four months. There may be options which would permit this period to be reduced significantly, but they would incur additional costs and would extend the overall period of working. No solid data is available for the replacement option, but even assuming the bridge structure is manufactured off-site and shipped in as a complete unit, the time needed to demolish the existing bridge and its foundations, to rebuild the affected quays, create a new set of foundations and support structures on both sides of the canal, and then install a new pivot system is likely to be considerably longer.

Under the rehabilitation option, a temporary lifting bridge for foot and cycle traffic would be readily achievable. The larger scale civil works required by at the replacement option would make such a facility more difficult to organise. While vehicular traffic would have the option of going around the port, this would be impractical for pedestrians. The economic impact of increased travel time and costs should, of course, form part of the economic analysis of the available options.

It is worth noting that the rehabilitation option has been costed by a potential bidder (See Appendix 3). The basis of the new bridge costings is uncertain, but appears to be budget figures for financial planning purposes.

7. Procurement

The SMPD is a public body, and therefore subject to EU rules on public procurement. For contracts to be tendered between 01/01/2016 and 31/12/2017, the maximum value of contracts above which international

² Based on an economic cost of capital of 3%, a difference in capital investment of €5,000,000, and fifty year time period.





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competitive tendering is required, with publication in the Official Journal of the EU, is EUR 209,000 for service and consultancy contracts and EUR 5,225,000 for works contracts.

For the civil and mechanical works involved in the rehabilitation option, national competitive tendering would be sufficient - although international tendering would always be desirable. For the replacement option, it is unlikely that national competitive tendering would be an option unless the works were to be split into multiple contracts, e.g. for civil works and bridge works, in which case the SMPD would have to argue that the works were not being split artificially and would carry the risk of any dispute between the contractors.

8. Environment, sustainability, social

As there is an established crossing, an Environmental Impact Assessment would not normally be required. However, there are a number of issues which should be addressed as part of the planning and building consent process.

Firstly, a new bridge would normally have to comply with current vehicle and pedestrian criteria - a point which the SMPD has emphasised in written and verbal responses. This will require the bridge to be higher and significantly wider than the Pont Colbert. This would have a number of knock-on effects:

- 1. If the new bridge is to be another swing bridge, then the area of land required on the pivot end of the bridge may be insufficient. The pivot would need to be set back from the canal by at least half of the increased width of the bridge and the swing radius beyond the centre pivot would either be compromised, or the pivot would need to be significantly stronger than the current design requires. The choice would then be to knock down some of the nearby homes and commercial premises, or to close an access road to the docks. Alternatively, the pivot could be put on the "*Capitainerie*" side of the canal, which would probably require the *Capitainerie* building to be demolished. This building is suffering from subsidence due instability of the Quay. Obviously, placing the pivot in that area would require substantial earthworks and ground stabilisation before any pivot foundations could be laid. It may be that these issues have already been fully addressed but, if so, the information is not in the public domain.
- 2. A second impact of a larger bridge would be its visual impact in one of the historic, conservation areas of the city.
- 3. It is possible that the weight of a new, larger bridge could be maintained at the same level as the existing bridge through the use of modern design techniques, higher strength steels, etc. Similarly, a more modern hydraulic system might but only might be more efficient. However, if the bridge is to open faster than before, then the energy efficiency improvement would need to be significant if it is to offset the greater energy needed to accelerate the bridge to its higher operating speed. Similarly, windage forces on a larger bridge are likely to be greater, requiring more energy.

At a wider level, the sustainability of the various options should be considered. The embodied energy of the existing bridge would be lost, unless the scrapped steel could be used without remelting, and the CO2







emissions required to manufacture and build the new bridge would be wholly additional to France's carbon account.

Finally, there is no doubt that native *Dieppois* and long term residents have a strong attachment to the bridge. It is part of their personal history and of the history of the city, having been an essential communication link, and has been part of the infrastructure of life in the Pollet district for nearly one hundred and thirty years.

9. Use, market, demand

The available evidence suggests that the SMPD views the bridge as having two, or possibly three, users: waterborne users and land based users, possibly split into vehicular and non-vehicular. However, it can firstly be argued that these categories need to be disaggregated, and extended to include other "user" groups. The following list is probably not complete, but it clarifies the different user needs and would be a contribution to the economic analysis which is, sadly, lacking from the current analysis.

Large merchant vessels: which should be the lifeblood of a commercial port. However, the limited data in the public domain, and the visual evidence on the ground, suggests that the inner basins' transit tonnage is falling. The port's overall commercial tonnage may not show a significant decline over time, but the areas of growth are in the outer harbour, not in the inner basins. Clearly, the nature of the transit of these ships, and their economic value to the port and the general economy, mean that they need to be given priority when entering and leaving the inner basins. However, as already observed, the speed of opening and closing of the bridge is not a critical part of the transit process.

<u>Small commercial vessels and service vessels</u>: the canal is host to a number of commercial and service vessels, e.g. tugs, pilot boats, fishing boats, which contribute directly and indirectly to the economic value of the port. The transit time of these vessels is shorter, and therefore the opening and closing times are more important within the total bridge cycle time. However, the economic value of these transits is also lower.

<u>Leisure craft</u>: a number of small craft may be moored within the inner basins or make use of the marine services located in the basin. The presence of these craft does have a positive economic impact on the city, through the fees paid for moorings and for the costs of goods and services supplied. However, the economic cost of keeping leisure craft waiting is relatively small and, provided the bridge's opening times can be predicted, there is no reason why a responsive service needs to be offered. Scheduled opening times would also reduce the economic loss of vehicular and pedestrian traffic being held up.

<u>Commercial and Emergency road vehicles</u>: Heavy Goods Vehicles are guided away from the port. This has two implications. Firstly, the need for a four-metre clearance falls away, and secondly the economic cost of holding up such vehicles while the bridge is opened can be ignored. The current clearance height of the bridge is 3.85 metres. This should be sufficient for almost all emergency vehicles. The only taller vehicles are fire tenders designed for high rise buildings, of which there are none in the Pollet district.





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<u>Private road vehicles</u>: While the number of road vehicle crossings is reported, the distribution of these vehicles over time during each 24 hour period, and the proportion which are being used for business as opposed to social and domestic travel is not reported.

<u>Pedestrians and Non-motorised vehicles:</u> While a first reaction might be to consider a vehicle crossing as more important than a pedestrian crossing, in reality most cars crossing the bridge appear to contain only one person. If this is generally true, then pedestrians should take priority because of the personal, social and economic benefits of walking as opposed to driving.

<u>Tourism</u>: Unlike most other 19th Century swing bridges, the Pont Colbert is not a listed or classified structure. This may well be attributable to the fact that it is a fully operational part of the city's transport infrastructure. It is a monument hiding in plain sight. There are perhaps four domains: *Dieppois* and tourists, who would wish the Pont Colbert to be retained:

- <u>Industrial Heritage</u>: the bridge is important in terms of its materials, its structural design, its use of early high pressure hydraulics, and its *modus operandi*.
- <u>Social heritage</u>: the canal drove a wedge through the poor Pollet district. The Pont Colbert offered, and offers, a link between the Outer Pollet district and the rest of the town. As a piece of mobile infrastructure the bridge continues to metaphorically knit the areas of the city together;
- <u>Cultural heritage</u>: The attempt to destroy the bridge at the end of August 1944, and its subsequent repair and re-opening in July 1946, may be seen as both an allegory and a symbol of France's will to return to normality after six years of war.
- Currently, Dieppe is at an <u>economic low-point</u>. The rehabilitation of the Pont Colbert offers the city the opportunity of a flagship project to act as a pioneer for a new economic orientation, building on the past to develop the future. A rehabilitated bridge would draw tourists for the heritage aspects mentioned above, but also broaden the existing tourism product. The marginal costs of linking the rehabilitation to a visitor centre housing the bridge's history, its artefacts, and the current control system would be low, and the impact on the town's attractiveness as a destination only two hours from Paris could be substantial. The existing control system could be retained in a visitor centre, offering visitors the possibility to drive the bridge either virtually, or physically using, say, a 1:25 reproduction of the bridge.

10. Investment cost

The rehabilitation cost has been estimated at EUR 3.83 million, plus a limited allowance for civil works, but including a temporary pedestrian crossing. To this should be added an allowance for a modern control system, with the option of tele-operations, and a visitor centre. The total budget implications would be of the order of EUR 4.5 - 5.0 million.

The strategic plan prepared by the SMPD assumes a cost of EUR 10 million to the replace the Pont Colbert. The costs of disruption within the port and for the local population are not included in that figure.





11. Financing Possibilities

The published strategic plan for the continued development of the port is based on assumptions about the future demand for the various families of operation taking place within the port. The expected funding need for 2105 - 2021 is indicated to be in the range EUR 49 - 61 million. The sources of funding are not presented, but the projects for the previous planning period were funded: 36% SMPD, 36% Region, 21% European Union, 5% Department, and 3% from the state. These figures strongly suggest that the port is not financially sustainable, and that continuing state aid is essential for the Port's future. State and EU grant aid is, of course, justifiable if the proposed investment projects show a positive economic return. However, at least in the case of the Pont Colbert, no details of the supporting economic analysis are available, and SMPD management did not appear to grasp the need for, and importance of, such an analysis.

It is also important to consider the future of the SMPD. It has been suggested that the SMPD will be subsumed into a larger, regional ports body in the near term. Such a move would allow the region's ports to be physically and financially managed more efficiently and effectively. However, Dieppe is a small port based on the niche activities of ferry terminal, gravel extraction, fishing, leisure and possibly wind turbine maintenance in the future. It does still have some general cargo business, which is reliant on the Pont Colbert, but with no local industry to drive demand, the sustainability of this activity is questionable. In the context of a regional restructuring, it might be more rational to transfer this activity to another port.

The economic and financial arguments for rehabilitating the Pont Colbert are stronger than the arguments for replacement. The initial capital costs are lower, and while in the short run the operating costs may be higher than for a new bridge, in the long run there will probably be little difference. With two to three generations of life in the Pont Colbert, and the rate of change of development in transport technologies, and the future uncertainty in demand for general cargo capacity, it is not a case for arguing to justify keeping the Pont Colbert, the financial and economic arguments suggest that it is the rationale for a new bridge which should be questioned.

12. Conclusion: Proposed Action Programme and recommendations

From a review of the Nomination Form and previous studies and reports, and following meetings with the various individuals and organisations associated with the bridge on both sides of the argument, there are a number of decisions which should be taken in respect of the bridge. The Nominating Body, supported by the Review Group, should:

<u>Firstly</u>, prepare a proposal, in due and proper form, that the Pont Colbert be awarded National Monument status, and that the proposal should be submitted to the relevant committee as soon as possible.

<u>Secondly</u>, seek to ensure that no decision on the future of the bridge is taken before a final, definitive decision has been made on the bridge's National Monument status. The shareholders of the SMPD should







be asked to give an undertaking to this effect for the current situation, and that this undertaking would also apply to any follow-on organisation which might take over responsibility for the port.

<u>Thirdly</u>, ask the shareholders of the SMPD to follow good practice, and insist that SMPD management retains the services of suitably qualified advisers to undertake a structured Cost Benefit Analysis of the "Colbert Crossing". The scope should include, as a minimum, the cases of rehabilitation of the existing bridge and replacement, and taking tangible and intangible, direct and indirect, costs and benefits into account.

Appendix I

Review Group Members

Name	Attribution	
M Etienne Poncelet	Membre du Conseil Scientifique d'Europa Nostra	
M Laurent Lévi-Strauss	Membre du Conseil d'Europa Nostra	
Campbell Thomson	EIB Institute (pro tem)/Euradvisers LLP	
M Jean-Bernard Cremnitzer	Architecte et Expert en Patrimoine Industriel	
M Philippe Brouard	Spécialiste en Mécanique et Automatisation	
M Pascal Stefani	Président du Comité de Sauvegarde du Pont Colbert de Dieppe	

Principal Counterparts in Meetings

Name	Attribution	
M Sébastien Jumel	Maire de Dieppe	
M Jean-Christophe Lemaire	Vice-Président du SMPD	
Mme Marie-Dominique Fouchault	Directrice du SMPD	
M Hugues Alisevitch	Directeur Adjoint, de M Derrien, SMPD	
Mme Le Guillou	Région de Normandie	
M Denis Rochas	Conservateur Régional des Monuments Historiques, DRAC	
Mme Wallez	Recenseur, DRAC	
Madame la Sénatrice	Sénat	







Catherine Morin-Desailly







Appendix II

Photographs and Map



The Bridge



The Location



The Lack of Maintenance



Hydraulic Ram and Drive Chain









The Control System



Map Centred on Pont Colbert







Appendix III



BAUDIN CHATEAUNEUF

III Devis estimatif :

Etudes, suivi, pilotage, postes généraux		680 000.00
Passerelle provisoire, astreinte grue		240 000.00
Remplacement platelage & butes roues		480 000.00
Encorbellement, gardes corps, accès PMR		295 000.00
Réparations métalliques		970 000.00
Echafaudage, confinement, protection anticorrosion		1 090 000.00
Eclairage, abords		75 000.00
	TOTAL PVHT :	3 830 000.00

Hors somme à valoir, travaux mécaniques, travaux de génie civil sur les bajoyers notamment.

En pièce jointe, nous vous joignons un planning avec les phases et contraintes de circulation.

Nous restons disponible pour tout complément d'information.

Veuillez agréer Monsieur, nos sincères salutations

Jean Hugues AUTISSIER Po Directeur du Département Rénovation Ouvrages d'Art

PJ:planning

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