

Ex post evaluation – Benin

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Sector: Road transport (CRS code 2102000)
Project: Lake Nokoué Bridge / Steinmetz Flyover
 (BMZ No. 1995 66 670* and 2005 65 754)*
Programme executing agency: Direction Générale des Travaux Publics (DGTP)



Ex post evaluation report: 2014

		Bridge (Planned)**	Bridge (Actual)	Flyover (Planned)	Flyover (Actual)
Investment costs (total)	EUR million	37.05	36.77	9.15	11.75
Counterpart contribution	EUR million	3.30	6.52	2.44	5.45
Funding	EUR million	33.75	30.25	6.71	6.30
of which BMZ budget funds	EUR million	33.75	30.25	6.71	6.30

*) Random sample 2014

**) Incl. additional financing in 1999 and 2001

Description: Both projects include measures closely related to the development of Cotonou's road network. FC grants first enabled the construction of a four-lane, 360 m new road bridge ("Konrad Adenauer Bridge"), linking the eastern and western parts of Cotonou over Lake Nokoué (BMZ No. 1995 66 670). The connecting roads to the east and west were upgraded to the same standard. Later (BMZ No. 2005 65 754), a four-lane north-south flyover was built over the Steinmetz roundabout to the west of the bridge.

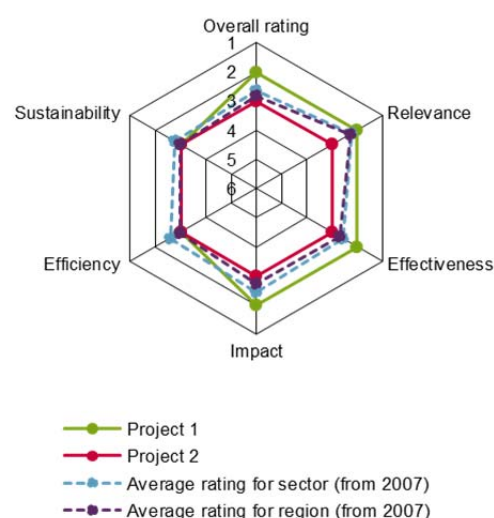
Objectives: The project aimed to ensure the transportation of people and goods between the eastern and western banks of the Lake Nokoué lagoon in Cotonou (1995 66 670) and in Cotonou city centre (2005 65 754) in line with demand. The overall objective of both projects was to facilitate the smooth flow of traffic in Cotonou (incl. trans-regional traffic) and promote urban development.

Target group: Road users in Cotonou and the surrounding area (inner-city and transit traffic).

Overall rating: 2 (bridge), 3 (flyover)

Rationale: Both projects focus on key traffic bottlenecks in the city. While the bridge has proved its worth in terms of traffic numbers, the Steinmetz Flyover is not an optimal solution from a purely traffic perspective, and this is reflected in the traffic numbers. Action is currently required in relation to traffic management and promoting public transport with a view to facilitating a long-term solution to the city's traffic problems. There is no risk to sustainable use at present, but routine maintenance has revealed some weak points. There are risks associated with periodic maintenance. Continued unrestrained growth in traffic numbers will reduce the time and cost savings of the target group in the medium term.

Highlights: Two well-known and highly visible projects. The bridge in particular is well used, but the concepts are no longer fully consistent with modern ideas regarding environmentally and climate-friendly urban planning.



Rating according to DAC criteria

Overall rating: 2 (Bridge), 3 (Flyover)

Relevance

At the time of the project appraisal, crossing the lagoon (Lake Nokoué) was one of the main transport bottlenecks in Cotonou. At the end of the 1990s, both of the existing bridges reached the limits of their capacity during rush hours. It was estimated that the volume of traffic would continue to grow strongly, and the actual growth even managed to exceed expectations.

Thus constructing a third bridge became a core issue of urban transport. Building the third bridge was included in the city's transport planning in 1996 and therefore became part of the city's urban planning programme. The original plan (1995) foresaw the building of a two-lane bridge, but in light of the traffic growth rates of more than 10 % per year in the mid-1990s, this plan was dropped in favour of a four-lane bridge.

The construction of the Steinmetz roundabout flyover was in response to the impacts of the new bridge on traffic and the absence of an envisaged pedestrian zone in Avenue Steinmetz. Without further construction work, the traffic on the roundabout would have hit its capacity limit right after the new bridge opened, meaning that the desired impact of the new bridge would not have materialised in full. High compensation payments needed to acquire land prevented the construction of an east-west flyover and the expansion of the roundabout traffic. From a purely traffic perspective, the building of a north-south flyover is just a compromise.

The results chains underlying the projects are still largely valid. Expanded land-based transport infrastructure should facilitate traffic flows and therefore save road users time and money, as well as contribute to urban development. In the context of urban development, the projects bring about a closer integration of both parts of the city. They certainly impact on the volume of traffic in the city centre, including heavy transport. There is no bypass and this would have been inconceivable even as an alternative to the chosen solution.

Simply expanding the choice of routes for motorised transport is not enough for a sustainable solution to the city's transport problems, because this always creates additional demand too. Traffic management as well as the promotion of a public transport system will have to play a key role in Cotonou in the future. In this respect the project approaches no longer meet the current concepts for promoting environmentally and climate friendly traffic planning in urban areas. All of the existing studies on Cotonou emphasise that a multi-modal system with buses and possibly also fixed-rail transport is needed to complement private transport.

Relevance rating: 2 (bridge), 3 (flyover)

Effectiveness

The project aimed to ensure the transportation of people and goods between the eastern and western banks of the Lake Nokoué lagoon in Cotonou (BMZ-No. 1995 66 670) and in Cotonou city centre (BMZ-No. 2005 65 754) in line with demand. The project objectives are largely appropriate, focusing on the outcome level of the use of road traffic infrastructure while the indicators measure traffic volume. Yet road traffic between the two ends of the lagoon travels not only across the FC-funded bridge, but also on two other bridges. Thus the needs-based road infrastructure affects all of the connections between the two parts of the city. The same applies for traffic in the city centre, which is not only influenced by FC-funded measures. Road maintenance (flyover indicator) is key to sustainable road use, yet there were no specific measures in the project targeting an improvement in road maintenance. The achievement of the programme objectives defined during the programme appraisal can be summarised as follows:

Lake Nokoué Bridge

Indicator	Status PA	Ex post evaluation
One year after commissioning, 35,000 vehicles per day.	-/-	Met. Data on 2010: 54,000-63,000 vehicles per day. Estimate for 2014 (annual growth rate 4 %): roughly 68,000 vehicles per day.

Steinmetz roundabout flyover

Indicator	Status PA	Ex post evaluation
(1) One year after commissioning, 33,600 vehicles per day on Avenue Steinmetz and 66,000 vehicles per day on the connecting roads to the bridge.	-/-	Presumably not met one year after commissioning, but now fulfilled. DGTP statistics for 2012 show 35,300 vehicles on Avenue Steinmetz (of which 35 % on the flyover). With an annual traffic growth rate of 4 %, roughly 38,000 vehicles use the route in 2014. For the traffic on the bridge, see table on bridge.
(2) Appropriate road maintenance.	-/-	Partially met. The flyover and road sections (including the bridge) are in good condition. Periodic maintenance has not been required as yet. Routine maintenance should be improved (e.g. maintenance of drainage system on flyover).

The benchmarking of the indicator for bridge usage was very conservative. It was no doubt assumed that one year after the commissioning of the bridge, vehicle use of the three bridges would still be in a transitional phase. In the following years, however, the traffic volume experienced rapid growth. Traffic on the flyover is lower than anticipated. This indicator was reached later than expected. Conversations at the project site revealed various reasons for this: (1) road users are not used to travelling over the flyover, (2) the transport links to the flyover are not optimal, (3) the main traffic artery is east-west and not north-south. Although the flyover does alleviate the roundabout traffic below (despite the much increased volume of traffic), it does not make enough of a contribution to facilitate a long-term solution to the traffic situation on the Steinmetz roundabout. Today roughly 200,000 vehicles cross the lagoon on the three bridges every day. This represents a drastic increase compared to the time before the bridge was built (130,000 vehicle units).

Effectiveness rating: 2 (bridge), 3 (flyover)

Efficiency

Delays played an important role during the project implementation. Changing the concept from a two-lane to a four-lane bridge with related access roads, the deeper bridge abutments required than originally expected and the construction of lanes on the access roads for two-wheeled means of transport resulted in a gap of six years between the first pledge of funding and the actual start of construction. Work on the access roads was delayed by two years on account of laborious processes to acquire the necessary land and make the related compensation payments. The approval of the bridge suffered delays too, as did the work on the flyover. International competitive bidding resulted in relatively low participation, but competition with appropriate prices can be assumed. However, the prices exceeded the project budget for the flyover and the bridge, and so the budget had to be amended.

The construction solution ultimately chosen for the bridge (EUR 15.29 million) as well as the ramps and access roads (EUR 14.68 million) seems appropriate, especially since there is now integrated traffic routing east-west over the new bridge and through Cotonou. The solution selected for the flyover (EUR 5.39 million) is also appropriate from a building perspective; it would have been better to build it in an east-west direction, but this would have increased the cost.

The compensation payments required to acquire land from the national railway company not only hindered the construction of the flyover in the other direction, but also resulted in relatively high costs of EUR 3.95 million (counterpart contribution) for the access roads to the bridge, even though the routing deviated from the original plans with regard to the land acquisition.

A macroeconomic calculation was made for the evaluation. The benefits are derived from lower vehicle operating costs thanks to the faster speeds (consumption and wear-and-tear are high in stop-and-go traffic). Depending on the scenario the gain is 11-23 %, which is influenced by growth in traffic volume and the maintenance of the bridge. Time savings are also monitored and monetised. Even if the time and money saved per road user is very low, the benefits add up to impressive figures thanks to the high volume of traffic on the bridge. No calculation was made for the flyover given the more complex traffic situation on the Steinmetz roundabout. In comparison to the bridge, we find the allocation efficiency to be somewhat weaker due to the lower use of the flyover.

Traffic volumes are expected to continue rising in the coming years, which will reduce average speeds and push vehicle operating costs up. Specific emissions will increase again too. This will take away some of the positive impacts of the projects for individual road users and allocation efficiency will tend to fall, but compared to the situation with two bridges, traffic is still better organised. These effects were taken into account in the macroeconomic calculation.

Efficiency rating: 3 (both projects)

Impact

The overall objective of both projects was to facilitate the smooth flow of traffic in Cotonou (incl. trans-regional traffic) and promote urban development. The savings in vehicle operating costs already outlined under "Efficiency", the time saved and the lower emissions could have been used as indicators. Specific emissions are falling in urban traffic due to the higher speeds.

The flow of traffic has improved significantly thanks to both of the projects, and so they have contributed to facilitating the mobility of Cotonou residents. Roughly half of the journeys made in Cotonou are connected directly to the work of the road users. The money and time saved have resulted in a more efficient use of resources for the entire economy. However, as mentioned above, these effects will tend to fall again.

Even without data to hand it is assumed that the projects have had a lasting influence on settlement structures east and west of the new bridge. Reports have been heard of new businesses and some new buildings, which imply a consolidation of the city's economic activities. Above and beyond this there are no anticipated far-reaching effects on urban development or structural impacts in the transport sector.

Roughly 10-20 % of the traffic is not confined to the city centre. Consequently, the projects are also impacting traffic on the transnational Abidjan-Lagos corridor. Yet the main bottlenecks on this corridor are not so much the current state of the roads as the lengthy and costly border crossings.

Both projects, but particularly the bridge, are highly visible. This factor, the high volume of funding and also the political focus (inaugurated by the former German Federal President Köhler) heightened the importance of the projects in the cooperation between the two countries. Benin continues to enquire about the financing of similar projects, even if DC priority areas and, as outlined above, the sectoral approaches to urban transport have changed.

Impact rating: 2 (bridge) / 3 (flyover)

Sustainability

Sustainable use of road infrastructure is heavily dependent on appropriate maintenance. No periodic maintenance has been necessary to date. Inspections of pillars and abutments have been carried out and no defects, such as erosion, have been found. In the medium term, the first likely action will be renewing the road surface on the access roads to the bridge. The routine maintenance carried out by Cotonou's administration could be more regular and more efficient, particularly regarding drainage infrastructure. The funds for periodic road maintenance provided by Fonds Routier are sufficient to cover roughly 50-60% of the maintenance work required nationwide. The very high proportion of illegal fuel in the country reduces the scope for Fonds Routier to increase its revenues by taxing fuel (currently 10% of the import price). Yet as the bridges play a pivotal role for road traffic in Cotonou, it is assumed that any necessary work will be treated as a priority. Donors have tended to withdraw from the transport sector, as well as other priority areas. This is also due to dissatisfaction with road maintenance and the general performance of competent authorities. This could possibly weaken the future supply of funds for maintenance even further. The life span of a bridge can be up to 100 years, and use is not expected to be restricted in the near future.

Sustainability rating: 3 (both projects)

Notes on the methods used to evaluate project success (project rating)

Projects (and programmes) are evaluated on a six-point scale, the criteria being **relevance, effectiveness, efficiency** and **overarching developmental impact**. The ratings are also used to arrive at a **final assessment** of a project's overall developmental efficacy. The scale is as follows:

Level 1	Very good result that clearly exceeds expectations
Level 2	Good result, fully in line with expectations and without any significant shortcomings
Level 3	Satisfactory result – project falls short of expectations but the positive results dominate
Level 4	Unsatisfactory result – significantly below expectations, with negative results dominating despite discernible positive results
Level 5	Clearly inadequate result – despite some positive partial results, the negative results clearly dominate
Level 6	The project has no impact or the situation has actually deteriorated

Rating levels 1-3 denote a positive assessment or successful project while rating levels 4-6 denote a negative assessment.

Sustainability is evaluated according to the following four-point scale:

Sustainability level 1 (very good sustainability): The developmental efficacy of the project (positive to date) is very likely to continue undiminished or even increase.

Sustainability level 2 (good sustainability): The developmental efficacy of the project (positive to date) is very likely to decline only minimally but remain positive overall. (This is what can normally be expected).

Sustainability level 3 (satisfactory sustainability): The developmental efficacy of the project (positive to date) is very likely to decline significantly but remain positive overall. This rating is also assigned if the sustainability of a project is considered inadequate up to the time of the ex post evaluation but is very likely to evolve positively so that the project will ultimately achieve positive developmental efficacy.

Sustainability level 4 (inadequate sustainability): The developmental efficacy of the project is inadequate up to the time of the ex post evaluation and is very unlikely to improve. This rating is also assigned if the sustainability that has been positively evaluated to date is very likely to deteriorate severely and no longer meet the level 3 criteria.

The **overall rating** on the six-point scale is compiled from a weighting of all five individual criteria as appropriate to the project in question. Rating levels 1-3 of the overall rating denote a "successful" project while rating levels 4-6 denote an "unsuccessful" project. It should be noted that a project can generally be considered developmentally "successful" only if the achievement of the project objective ("effectiveness"), the impact on the overall objective ("overarching developmental impact") and the sustainability are rated at least "satisfactory" (level 3).