

Paphos-Polis Motorway

Environmental Statement
Non-Technical Summary
2007



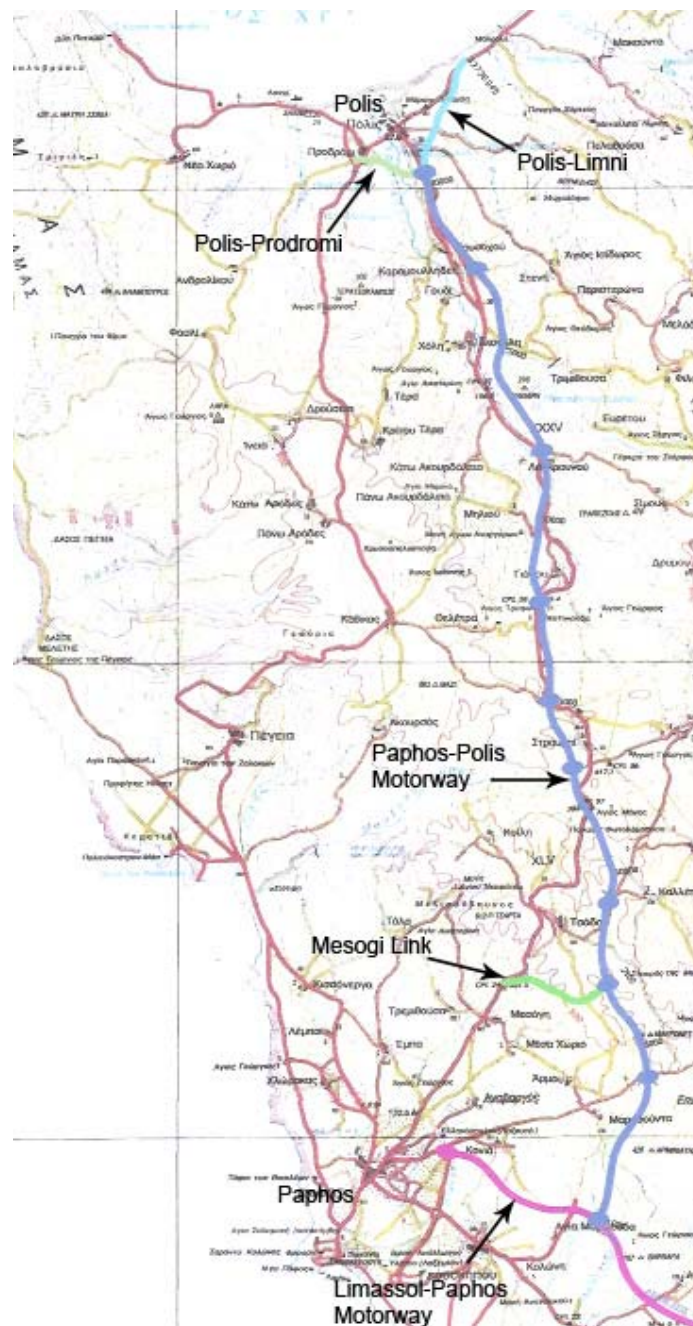
Public Works Department

Introduction

The Cyprus Government, Public Works Department, has decided to upgrade the B7 Paphos-Polis road to motorway standards. The scheme is programmed to open in 2013.

An Environmental Impact Assessment has been completed on the proposed motorway scheme and the findings are set out in an Environmental Statement.

This Non-Technical Summary sets out the key findings of the Environmental Statement.



The Need for the Scheme

The existing Paphos-Polis road is expected that by the year 2009 it will reach its capacity, meaning that the volume of traffic will be such that the road as it is will not be able to sustain it and it will have to be upgraded to a motorway.

Also, in the last 9 years, 23 people have lost their lives in traffic accidents in this road.

Therefore, it was decided that upgrading the existing road to a motorway will offer better quality service and it will absorb the increasing traffic volume from tourists and local people.

Objectives

The Paphos-Polis improvement has been developed in accordance with the following key objectives:

- **Environment:** to reduce the impact on the built and natural environment, and lessen the adverse impacts on people through design and effective management of the network.
- **Safety:** to improve safety for all users within the road corridor and reduce the risk of accidents.
- **Economy:** to support sustainable economic activity along the road corridor, reducing delays and improving journey time reliability.
- **Accessibility:** to provide improved access to holiday resorts and also to employment areas.

Alternative Route Options

Alternatives for the alignment were considered as part of the development of the Outline Design, using the outputs of earlier environmental feasibility studies (EMC 1999), before a preferred scheme was identified which was considered to best meet the scheme objectives.

The Proposed Scheme

The proposed scheme comprises the motorway carriageway, its earthworks, tunnels, viaducts and drainage structures.

The proposed alignment for the main motorway leaves the A6 Limassol-Paphos motorway at Agia Marinouda and traverses the lower slopes of the eastern flank of the Marathounta Valley to the east of Marathounta village, and approximately 5Km east of the existing Paphos-Polis road.



The alignment passes very close to the Geomorpha at the Marathounta Interchange (Km 4.1) before running up the valley towards Tsada, passing to the west of the golf course before tunneling through the ridge to the east of the village.



After another short section of tunnel the alignment viaducts over the existing Paphos-Polis road at Km 12, approximately 2 Km to the south of Stroumpi, and from this point onwards the alignment is located within the topographic corridor of the existing road.



The alignment passes approximately 500m to the west of Stroumpi and Giolou villages and approximately 500m east of Miliou before viaducting over the existing road at Km 21.

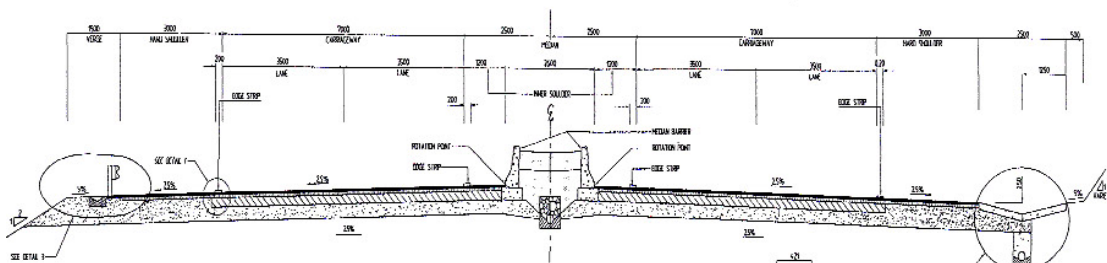


From here to Polis the alignment is located to the east of the existing road and the Chrysochou River, and approximately 600m east of Skoulli, 900m east of Goudi and 200m east of Chrysochou villages. At Skoulli, the alignment is to be constructed on a viaduct.



The total length of the main motorway is 31Km and it consists 11 interchanges, 25 underpasses, 8 overbridges, 7 viaducts and 3 tunnels.

The scheme also includes 3 link roads with a total length of 8.2Km (the Mesogi link – 3.1 Km, the Polis-Prodromi link – 1.8 Km and the Polis-Limni link – 3.3 Km).



Environmental Impact Assessment

The Environmental Impact Assessment has been carried out as an integral part of the scheme design and appraisal in order to minimize environmental impacts.

The purpose of the assessment is to undertake sufficient assessment to identify the various (environmental) factors and the effects upon them to be taken into account by the Design Organization in developing and refining route options.

The aim of this environmental assessment and mitigation study for the Paphos-Polis motorway and its link roads is therefore to carry out investigations sufficient to identify the locations and mechanisms of significant impact and to propose outline mitigation options.

Consultations

The design and environmental impact assessment of the scheme included consultations with a range of government agencies, non-government organizations and landowners. Consultation responses were used to inform the evolution of the conceptual design, identify key environmental issues, and to develop mitigation measures.

The Environmental Impact Assessment for the scheme was presented to the Environmental Service of the Ministry of Agriculture, Natural Resources and Environment on July 30th 2004. The Environmental Committee reviewed the assessment and made its final decision which was made known on December 22nd 2004. In their report, some of the recommendations were about changing the alignment. The proposed change of the alignment was overruled by ministers ad-hoc (Minister of Finance, Minister of Communications and Works and Minister of Agriculture, Natural Resources and Environment) because the change was not technically feasible, on November 28th 2005.

Environmental Impacts and Mitigation

Geology

Potential impact on land stability through cutting of weak materials has been identified especially in bentonites and weathered volcanic rocks. Mitigation measures include geotechnical design of slopes, stabilization works and erosion control.

Erosion can occur from the road/slope drainage and in cuttings, which can be controlled with drainage and erosion control.



Meteorology and Hydrology

Surface runoff patterns will change significantly within the corridor of the scheme. This can be dealt with maximizing the number of culvert outlets.

Six water-supply boreholes are located close or on the Right of Way, and two water tanks within the Right of Way. The water which will be used for compaction and control of dust during construction will conflict with local water requirements. Control measures include compaction during wet season and use of coverings rather than water for dust control. Also, water can be imported from less sensitive areas and liaisons with the water board and the farmers over the use of water can help.

Water quality can be affected from silt and other sediments washed from exposed slopes during construction and early operation. Potential contamination of surface water and groundwater by toxic spillages can occur during construction. Road runoff may adversely affect water quality in sensitive areas. Mitigation measures include control of water generally during construction and operation, erosion control measures, containment measures during construction and control and treatment of road runoff in sensitive areas during operation.

Spoil Disposal

The principal engineering issue is that of spoil disposal. Construction of the motorway will generate 8 million m³ of spoil material. Estimates indicate that the volume of material required for landscaping works to reduce the noise and visual impact of the motorway is between 0.5 and 1 million m³.

A total of 47 potential spoil disposal sites were identified along the route corridor. A limit of 5 km from the proposed centerline was generally applied to the identification of these sites. Despite the relatively large number of sites identified, the emphasis must be placed on the selection of a small number of large sites, both for environmental/mitigation reasons and for economies of scale. In particular, there is a need to find large spoil areas in the southern part of the route corridor, principally south of the proposed Tsada tunnel. A large potential spoil area exists to the south of Episkopi that, following confirmation of geotechnical acceptability, could accommodate the large majority of material generated by the project.

An assessment has been made of construction material sources in order to determine whether new quarries and borrow areas will need to be established in order to facilitate motorway construction. The existing reserves in the Androlikou limestone quarries could provide all necessary quantities of sub-base material type 2, water bound Macadam road base, bituminous road base and all classes of concrete for structures, lined ditches and other concrete elements, since no diabasic rock is quarried in Paphos district, the source for base and wearing course materials is most likely to be the quarries in Parekklesia and Agios Mamas areas (Limassol). On this basis, no new quarries will be required.

Land Use and Land to be Affected

The total area to be acquired for the scheme is 2,102,000m² and it includes 402,000m² of vineyards, 259,000m² of olive and almond orchards, 50,000m² of citrus orchards, 31,000m² of vegetable gardens, 309,000m² of arable, 5,000m² of forest/woodland, 1,002,000m² of uncultivated scrub, and 44,000m² of housing and industrial area. The acquisition of land is mitigated through compensation.



Population, Social and Economic Issues

The construction and operation of the motorway is not expected to have any significant impact on demography within the alignment corridor. An agricultural auxiliary building will be demolished and the owners will be compensated. Two houses and a row of villas are located within 50m of the Right of Way. Two more houses and apartment and villas blocks are located within 50m - 100m of the Right of Way. Also one village ("Olympic Village") is located within 250m of the Right of Way and three villages (Marathounta, Kallepeia and Stroumpi) are located within 250 - 500m of the Right of Way. Screening from visual and noise impact as much as possible is considered the best mitigation measure.

The commercial premises along the existing Paphos-Polis road will experience less passing trade and operation of the motorway may encourage greater commercial development at interchanges and Polis, at the expense of the existing route.

Public Access

Approximately 60 local accesses are crossed by the alignment. All the main roads are accommodated plus 50% of the local accesses are reinstated.

Town Planning Interface and Proposed Infrastructure Projects

The alignment passes through scheduled agriculture zone for 14,800m, schedule livestock zone for 450m, scheduled residential zone for 400m and through protected zone for 2,700m of the alignment. Also a 132KN power line that is planned to be constructed within the alignment corridor will be relocated.

Cultural and Heritage

There are no operational churches affected by the proposed Right of Way. Measures should be taken though to ensure that any impacts during construction are minimized.

One mined flour mill is affected by the scheme and in order to avoid demolishing it, the adjacent embankment should be replaced by a retaining wall.

There are considered to be an excess of 1000 tombs discovered or yet to be discovered around the Polis area and there is a reasonable likelihood that some artifacts will be uncovered during construction of either the Limni or Prodromi link roads. The Department of Antiquities must be given the opportunity to survey the area occupied by the temporary and permanent works before construction and it must be alerted as soon as any monuments are found.

Landscape and Visual Impacts

The study area comprises a series of rivers that form a pattern of hills and valleys. The area is dominated by agriculture with only the major towns being Paphos and Polis at each end of the scheme.

The assessment of landscape is based on dividing the area into a series of discrete Landscape Character Areas (LCA). These areas form the 'baseline' landscape condition from which the impact of the scheme can be judged.

The Paphos coastal plain (0-2200m) is a very large-scale relatively featureless landscape that has suffered tipping and earthworks and already includes the Limassol-Paphos motorway, the airport and the edge of the city. The low hills, local Geomorpha and small area of lush vegetation all have very localized visual quality.

The area around Marathounta (2200-6000m) is a continual series of varied shape valleys with limited natural vegetation though occasionally prominent. Generally this area is of rather varied pattern, of moderate visual quality, though the narrow valley to the north is of higher visual quality, and remote and quite.

The landscape of a large-scale agricultural area with prominent terracing (6000-12000m) producing a simple regular horizontal banded pattern is of moderate visual quality, though the lower valley is of higher quality.

The narrow fertile agricultural valley (12000-26500m) is a series of sinuous valleys enclosing intensive lush agricultural areas of high visual quality and covered by the designation of 'Area to be protected for its beauty and landscape quality'. This landscape, particularly to the north is particularly distinctive and attractive.



The Polis shallow coastal valley (26500-33738m) is a large-scale flat predominately agricultural landscape abutting the towns with orchards and citrus groves and by new development.

Mitigation methods fall into types of earthworks and into the establishment of new planting. As part of earthwork treatments, it is proposed that cutting slopes are treated by rounding off the top and end edges of their faces to integrate them into the adjacent form of hills. It is also proposed that any benching be in the form of a series of small, irregular spaced narrow benches on the upper slopes of the cut faces. Other earthwork mitigation will include the construction of 'false cuttings' and mounds.

The treatment of earthworks and cuttings in providing a rougher surface and smaller irregular benching will encourage the colonization of these slopes with the native grasses and a herbeous layer, which are capable of establishing in such adverse conditions. As the study area has little natural vegetation, other than grass and a herbeous layer, only limited areas will be planted with native scrub and small species.

Ecology

Two Natura 2000 sites are located within, or within close proximity of, the survey corridor. Both of these sites are presently designated as “Sites of Community Importance” and are proposed Special Areas of Conservation. These sites are the Mavrokolymbos Natura 2000 site and the Periochi Skoulli Natura 2000 site.

The Mavrokolymbos Natura 2000 site is located to the west of the proposed route just south west of Stroumpi. At its closest point the site is located about 400m to the west of the route.

The proposed alignment for the Prodrumi link road passes over the northern part of the Periochi Skoulli Natura 2000 site. Where it crosses the site, the road will be mostly on viaduct to minimize possible impacts. The viaduct will however have a number of supporting piers located within the site.

Also, Phrigana, Maquis and Riarian vegetation will be affected by the land acquisition and dust as well as some birds, reptiles and amphibians will be affected by the light, noise and construction activity which will cause the wildlife to leave the area.



Mitigation has been proposed to ameliorate significant effects identified in the assessment. Where feasible any temporary and, where possible permanent ancillary works, should be located in areas of lower quality habitat. Construction compounds should be located outside the Sites of Community Importance. Haulage routes should follow the footprint of the proposed viaduct route in order to limit disturbance of adjacent habitat. Areas of temporary landtake should be subject to a program of vegetation reinstatement devised and overseen by an ecologist.

A contribution should be made to the management of the remainder of the Sites of Community Importance, and if appropriate a management plan prepared for the area which has been affected by the scheme. Construction areas around bridge piles should be screened in order to reduce the visual disturbance caused by human activity on sensitive receptor populations and also good site practice should be observed.

Noise

Traffic noise is a potential problem for residents of properties that are situated near to the proposed alignment.

Noise barriers and/or earth bunds will be constructed at a number of locations along the route to provide screening from traffic noise for properties near Marathounta, Giolou, Miliou, Simou, Skoulli, Prodromi, Paphos and Polis.

Scheme Procurement

It is anticipated that the proposed scheme will be procured by means of a Design, Build, Finance and Operate (DBFO) contract. The contractor will complete the detailed design, construct and finance the project and maintain it for a period of 30 years.

The Environmental Statement is based on a specimen design. The final design will result in no material change to impacts described in the Environmental Statement. Otherwise, an addendum to the Environmental Statement will be required.