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OPTIONS FOR DEVELOPMENT OF ROADS IN EAST AND WEST FALKLANDS

Introduction

At the request of FIDC, McAdam Design were asked to undertake a study of the options for the construction of camp roads. The study was confined to the major primary routes as specified in the Prynn Internal Transport Study, a total network of approximately 200 Km linking the main settlements in East and West Falklands. The following report defines three possible road types, assesses budget global costs for the options discussed and gives recommendations as to how best to proceed to the next planning stage.

Objective

The purpose of this report is to present criteria for considering the options relevant to establishing and implementing a strategy for developing a public road network to service both East and West Falkland Islands. Recommendations and conclusions concerning technical and resource matters are made which, if accepted, should be supplemented by other considerations, such as financial, environmental, priority and political options. As a result of these deliberations it should then be possible to create procedures and programmes for the development to be implemented.

General Criteria

In this report the extent of the roads under consideration amounts to some 200 Km approximately equally distributed between the two Islands, all as generally indicated on the enclosed plan; this represents current opinion of the extent of the desired public road network. Irrespective of standard of road in respect of width, grade, or geometry, it should have a design life of 20 years with acceptable levels of maintenance. The limitations of availability of construction materials, labour, and plant should be acknowledged; this being particularly the case for West Falklands. Nevertheless, although this might impose constraints this time, every effort should be made to not preclude future improvements such as paved surfacing.

Associates

Road Standards

For the traffic loads envisaged it is clear that density is not a determining factor, but rather safety considerations dictate that the carriageway width should be at least 5 m to allow the necessary margins for driver error and for passing manoeuvres. The weight of traffic is clearly less than Category 1 of MOT standards viz infrequent use by commercial vehicles up to 45^{t} gross weight with axle loads not exceeding 11½^{t}, and if the road is constructed to this Category 1 Standard, it would have the design life exceeding 20 years. In view of these criteria, three categories of road are considered appropriate:-

(a) For very remote areas the construction would be the provision of a 5 m wide stone carriageway laid on existing tracks at as-found grades and geometry. Crossing streams and waterways would be culverted. This construction does not permit paving the surface ultimately.

(b) Generally on roads forming communications between reasonable populations the construction would be the provision of a 5 m wide stone carriageway with a design speed of 50 Km/hr. Such a road would have grades limited to 10% except over very short lengths where 12% might be accepted. Vertical and horizontal geometry to provide the safe sight distances might require structures to be erected in the most difficult terrain. Crossing streams and waterways would be culverted, and graded drainage channels to each road side, would both be adequately sized to not create flooding. This construction permits paving the surface at some later time if required.

(c) Similar in all respects to (b) except that the carriageway width would be 10 m. This construction would only be necessary at some population centres, or for particular safety reasons where traffic may concentrate, eg parking, junctions, and centres of interest.

For all these road types the typical construction would be 450 mm stone layer for areas with CBR over 5%, 750 mm stone layer for areas with CBR 2%-5%, and 1000 mm stone layer for areas with CBR not exceeding 2%. Geo-textiles for particularly soft areas would be incorporated.

Material Resources

The materials required for this construction are stone, culverting goods, bridging, and finally at some later stage paving such as bitmac or concrete.

The existing quarry near Stanley is not ideally located to service the sites on East Island which are centred at some distance to the west, and could not reasonably be considered for the works on the West Island. Again the output required in any reasonable timescale for this development would place undue strain on its capacity, particularly if other current develop-

(a) Road type (a) previously described comprising a 5 m wide stone surface over existing tracks, with minimum thickness 450 mm, average thickness 600 mm, reinforced where necessary with geo-textiles, having side ditches approximately 750 mm deep, and with 1.2 m diameter culverts for crossing watercourses.

Cost ..... £55,000 per Km of road

(b) Road type (b) previously described comprising a 5 m wide stone surface to suitable geometry for adequate sight distances for a design speed of 50 Km/hr and grades not exceeding 10%, having a minimum thickness of 450 mm, average thickness 750 mm, reinforced where necessary with geo-textiles, having graded side ditches average 1.5 m deep, with 1.2 m diameter culverts for crossing waterways, and with single width Bailey Bridging over major crossings up to 40 m span.

Cost ..... £92,000 per Km of road

(c) Road type (c) previously described comprising a 10 m wide stone surface and all further as (b) above.

Cost ..... £145,000 per Km of road

(d) Piping side ditches of road with pipes ranging from 300 mm to 900 mm diameter.

Cost ..... £40,000 per Km of road

(e) Bitmac surfacing to 5 m carriageway including edgings (quantity to be adequately large).

ments proceeded concurrently with their increasing demands. It seems clear that this programme should envisage the establishment of new quarrying facilities of a mobile nature operating at a number of strategically placed suitable quarrying sites during this programme, and ultimately remaining as a permanent installation on West Island.

Materials for culverts, bridges, etc, would be imported.

When paving surfaces is envisaged the choice depends on the amount being undertaken. If only small lengths, or infrequently, then locally produced concrete would be the economic approach. However if the quantities justify, there is the strong probability that bitmac would be more economic, and this would be produced by an imported mobile plant. There seems little economic justification for a permanent bitmac producing plant.

Labour Resources

It is anticipated that the present difficulties with recruiting labour for works of this scale will continue, primarily because other current developments under consideration will increase

Conclusions

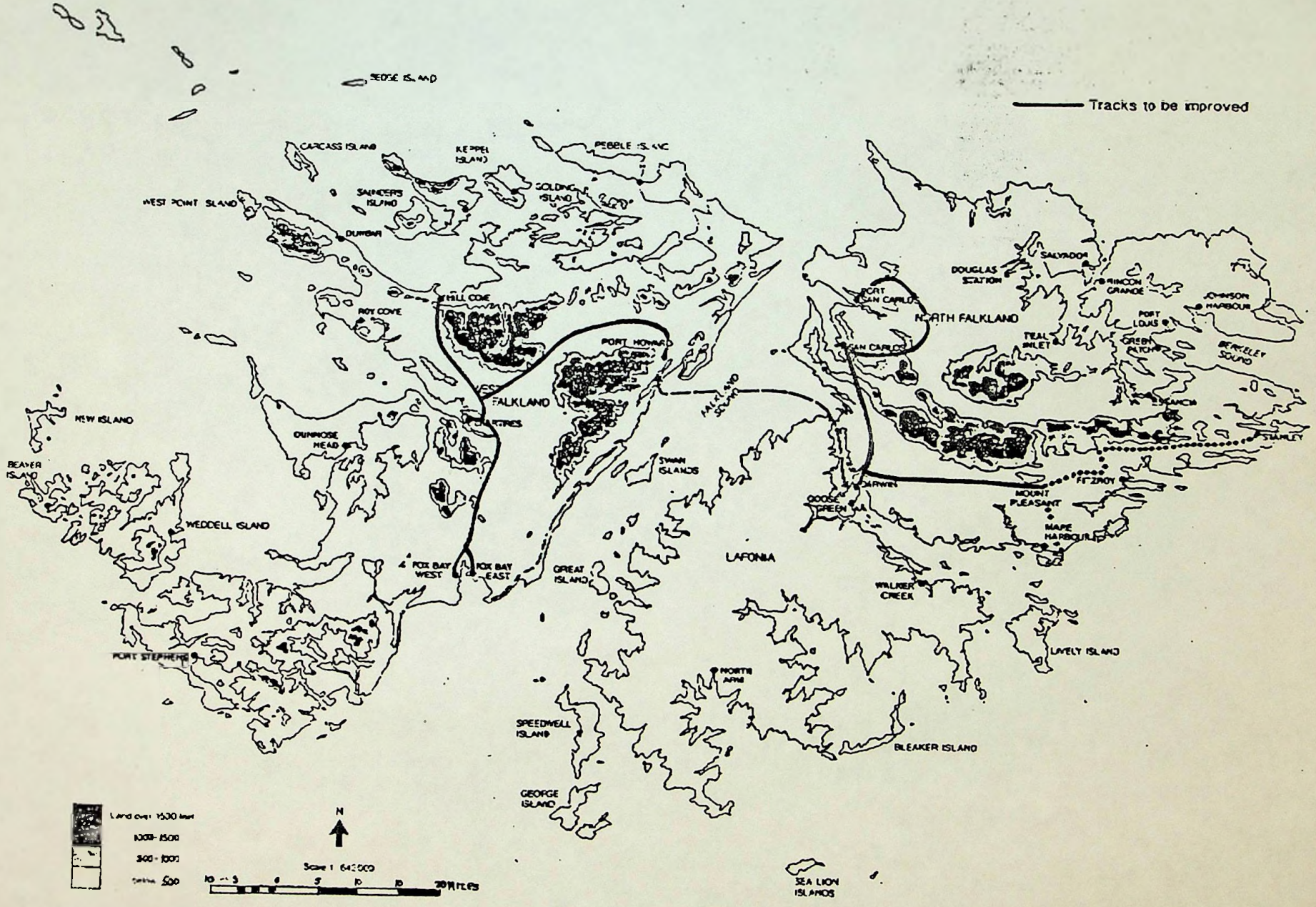
If the proposals regarding standard of road construction, mix of road types, and procedure for undertaking construction, are accepted, then a programme extending over a period of 5 to 8 years should envisage a total outlay at todays rates of £17m. Shortening the period would force the prices up unreasonably. Extending the period incurs the penalties of protracted establishment costs, and would imply a level of output that would not cope with on-going maintenance as well.

To progress further with the programme outlined above requires the implementation of the following:-

(a) Establishing a procedure enabling the construction to proceed under the direction of an enabling Authority appropriately staffed and founded.

(b) Establishing a financial programme over an accepted time-scale.

(c) Establishing the extent and order of priority of the programme in conjunction with (b).


Tracks to be improved
SEDGE ISLAND
CARCASS ISLAND
KEPPEL ISLAND
PEBBLE ISLAND
WEST POINT ISLAND
SAUNDERS ISLAND
GOLDING ISLAND
DUMBAR
HILL COVE
ROY COVE
PORT HOWARD
FALKLAND
FALKLAND SOUND
DUNNOSE HEAD
SWAN ISLANDS
NEW ISLAND
BEAVER ISLAND
WEDDELL ISLAND
FOX BAY WEST
FOX BAY EAST
GREAT ISLAND
LAFONIA
PORT STEPHENS
NORTH ARM
SPEEDWELL ISLAND
GEORGE ISLAND
BLEAKER ISLAND
SEA LION ISLANDS
WALKER CREEK
LIVELY ISLAND
DOUGLAS STATION
SALVADOR
RINCON GRANDE
JOHNSON HARBOUR
PORT LOUIS
PORT SAN CARLOS
NORTH FALKLAND
SAN CARLOS
TEAL INLET
GREEN PATCH
BERKELEY SOUND
DARWIN
GOOSE GREEN
FITZROY
MOUNT PLEASANT
MAPE HARBOUR
STANLEY
N
Scale 1 : 625000
20 Miles