



INTERNAL TRANSPORT REVIEW

for the

**FALKLAND ISLANDS
GOVERNMENT**

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1. EXECUTIVE SUMMARY

1.1 Purpose of the Review

The Review has three principal objectives:

- To review progress to date in the development of the internal transport infrastructure of the Falkland Islands
- To provide a summary of the resources already committed to transport
- To provide options for the continued development of transport infrastructure and recommend the best method of co-ordinating air, sea and land transport for optimum benefit.

1.2 Principal Findings

- The original concept of a system of spine roads linking the main population centres on East and West Falkland remains valid.
- There will be a continuing demand for inter-island shipping, concentrating activity on key ports and outer islands, together with a link across the sound. FIGAS will continue its traditional role, but to fewer destinations and with increasing emphasis on tourist traffic.
- Resources committed to the development of internal transport infrastructure since the beginning of the road programme are £19.2m in capital and £0.87m per annum current operating costs.
- More clarity is required in the method of prioritisation and the terms of reference for construction of link roads.
- Spine roads should remain the highest priority, with additional resources allocated in order to complete construction within six years at a total cost of around £8million.
- The link road programme should complete within 10 years at a total cost of around £3.6m.
- There should be a deep water jetty at Port Howard to take northbound wool freight, and a jetty at Newhaven to coincide with the opening of the new abattoir.

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- Once construction programmes are agreed PWD should be given a mandate for a 3 year rolling programme to avoid time delays, resource shortages and to obtain competitive prices.
- Revised schedules and tariffs for inter-island shipping should be prepared on the key port concept, including the outer islands, with sound crossings and Punta Arenas trips.
- Tamar should be retained until at least 2000 and the situation further reviewed at that time.
- FIGAS should be responsive to customer demand and be prepared to implement revised shift patterns, particularly during the peak summer months.
- There should be enhanced expenditure on airstrips at key locations. No alternative airframes are recommended immediately but the introduction of rotary wing should be kept under review.

2. INTRODUCTION

2.1 Background

As the pace of change in most aspects of life in the Falkland Islands has increased, so the pace of change in internal transport has begun to increase. The first definitive study of internal transport systems was carried out by Halcrow Fox and Associates in 1985 (published in 1986) and followed in 1988 by a more detailed study of the East-West Ferry and West Falkland Shipping by Pannell Kerr Forster. However by 1989 few of the strategies and recommendations from these in-depth studies had actually been implemented, since no action plan had been created either by the studies themselves or internal work. No specific provision had been made in the FIG budgeting process for internal transport enhancement or change, and no department of the government had been made responsible for carrying out transport policy. In the light of this in 1989 FIDC commissioned the Internal Transport Action Plan and Executive Council set up a Transport Advisory Committee to review all aspects of internal transport and make recommendations. The Action Plan formed the basis for its earlier considerations.

The recommendations of the Action Plan were broadly accepted, and were these.

1. The core of the internal transport system should be a system of improved camp tracks on East and West Falkland connected by a ferry across Falkland Sound, at a total cost then estimated at £12m, over a 10 year period. The tracks contracts should be let on a design and construct basis to expatriate contractors. The principal routes to be

MPA - Darwin + East ferry terminal
Port Howard - Chartres
Chartres - Fox Bay
Chartres - Hill Cove

[This routing implicitly acknowledged the route being built towards the north camp started by PWD in 1986, which was expected to continue].

The new roads should be generally equivalent to the standards adopted for the Estancia track, being a 3m-4m wide stone carriageway laid on existing tracks at as found grades and geometry.

2. This should be supplemented by a programme of financial assistance to those who wish to construct links to the main camp track system.

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3. When the improved camp track system on East Falkland reaches a suitable landfall on Falkland Sound (probably Port Sussex) a ferry service across the Sound should be implemented along the lines set out in the PKF report. [The PKF report recommended a ro-ro type ferry with fixed jetties.]
4. Coastal Shipping Ltd should continue to operate on the basis of the Monsunen and Forrest until such time as the ferry is operational and the improved camp track system is well established. At that stage one of the existing vessels could be retired and thought given to the eventual replacement of the other vessel by a container based system. In the mean time assistance and encouragement should be given to landowners to maintain and improve their jetties, and the CSL tariff structure should discriminate more strongly against those who do not.
5. In aviation, the existing policies and programmes should be maintained.
6. PWD should continue to have responsibility for the camp tracks programme, but it should engage suitable experienced consultants to assist with the preparation of the schemes and supervision of expatriate contractors who would be entrusted with the construction work.
7. The overall internal transport capital programme should cost £14.8m over a 10 year period, with a maximum of £2.3m in any one year. The costed implementation plan with capital expenditure on transport estimates and projections (89-94) are attached.

2.2 Progress to Date and Terms of Reference

Virtually all of the action plan has been implemented or started - with the exception of the East-West link - indeed much has been done in addition to or in advance of the Action Plan. This being the case it has been agreed by Executive Council that a further review of transport policy is required, effectively updating the Action Plan with future proposals for capital expenditure. The Terms of Reference are these:

The undertaking of a Review of Transport Policy for the Falkland Islands. This will include air, sea and land transport, and will further include the following matters:

- Review of the current position (ie mid 1996) of extent and standard of air, sea and land facilities
- Comparison of planned position to actual position

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- Summary of resource already committed by FIG to transport facilities and infrastructure
- Summary of options with costings and priorities for further projects designed to improve air, sea and land transport facilities
- Summary of best methods of co-ordinating the three methods of transport for optimum benefit to Islands
- Production of a Report on or before 30 June 1996 dealing with the issues.

2.3 Method of Approach and Report Layout

The first three elements of the Terms of Reference will be dealt with in Section 3 which reviews progress to date in road, sea and air transport. It also takes account of changes in circumstances which have brought forward or delayed elements of the transport programme. This report will not review in any detail the HFA Report, the PKF Report or the Action Plan, nor revisit the original rationale for undertaking the roads programme and the complementary amendments to sea and air transportation, since it is taken that these original arguments still stand.

Section 4 summarises resources currently committed to internal transport.

Section 5 will review in detail the options for completion of the core roads and the provision of link roads or tracks. Particular attention is paid in this Section to the choices to be made in relation to speed of construction, quality of road, ability to upgrade and overall cost. In examining priorities it is necessary to reassess the method of determining priorities set by Exco in April 1994. This Section interlinks closely with Sections 6 and 7 since key decisions in relation to the construction (or not) of a deep water jetty on the West have effects on the amount of freight which might be moved by roads on the West, and therefore on both the design of roads and the pattern of coastal movements.

Section 6 which deals with inter-island shipping considers the general pattern of freight movements, the likely future demands and therefore the type of vessels(s) required. An important element for consideration is the changing pattern of MOD supply requirements on the West and the ability of a ferry service to satisfy those needs. It also considers the issue of whether there should be a deep water port on the West and the continuing service to the outlying islands.

Section 7 deals with aviation and the changing pattern of aircraft usage as a result of the road network and tourist usage. The likely future pattern of tourist use must be considered given the changes to tourist type and category which will occur if the DAP jet service from Punta Arenas is firmly established.

Section 8 summarises the capital costs of the recommended programmes.

Section 9 offers some observations on the continuing role of the Transport Advisory Committee and how it might operate most effectively.

Finally Section 10 provides a summary of the conclusions and recommendations.

3. TRANSPORT SYSTEM - CURRENT SITUATION

3.1 Roads

The basis of planning the road system has been that there should be a system of spine roads linking the principal settlements/ports, and that these should be designed to a standard to be all-weather, and capable of taking known or expected levels of traffic, and also capable of being upgraded to take heavier or greater volumes of traffic if required. It had originally been envisaged that these roads would be constructed by PWD or by outside contractors, though during the course of construction one local contractor has emerged who is capable of constructing spine roads, and others have undertaken substantial link road works.

It was also envisaged that in addition to spine roads, FIG would fund self-help schemes, either in advance of the spine roads to enable some landowners to gain earlier access to the road system, or to allow landowners to link to the spine roads where they would otherwise not be on the road.

Following an early flood of applications for link road works (most of which was carried out) it became increasingly apparent that more resources were required in some areas to provide a durable and effective solution. The concept of "flying squads" was introduced, one on each of the East and West with relatively light plant and 2/3 operators who could build non-continuous link tracks. The flying squads have been successful in some areas but it has become evident that this type of link work is not always suitable, especially where there are long stretches of soft ground. A further review of this type of work is required to determine whether it can have longer term effect.

3.1.1 Spine Roads - East

The 1989 plan for spine roads on the East was to continue the PWD works past Estancia to Port Louis, and then to Teal Inlet and Douglas, and possibly on to Port San Carlos. In six seasons this work has been completed. The plan also envisaged a road being built from MPA to Darwin and the East ferry terminal (probably Port Sussex). In the event the site chosen for the East ferry terminal was Newhaven, and a contract let for construction of the road from L'Antioja stream to Newhaven, by-passing Darwin and Goose Green, and crossing Cobbs Pass to assist traffic to North Arm/Walker Creek. The contract was only completed to Darwin due to contractual disputes; it is now envisaged that the spine road should continue through Cobbs Pass and on to North Arm, with options for spur roads or link roads to Walker Creek, Newhaven and the new national stud flock site at Saladero. The option also exists to complete a road from Burntside to San Carlos (on which substantial

advance works have been done), and to complete the North Camp circular link from San Carlos to Port San Carlos.

The whole programme would take another 8 seasons and complete the spine roads to all the principal population centres of East Falkland.

3.1.2 Link Roads - East

A number of sites in the north east remain to be linked to the main road. These are (in no particular order):

- (a) Greenfield. 6 residents. 25-30,000 kg of wool. Just over 10 km to the San Carlos River and on to the Douglas-PSC road near Gibraltar Gate. No port option. No airstrip.
- (b) Cape Dolphin 2 residents, 20-25,000 kg of wool, and Elephant Beach 5 residents, 20-25,000 kg of wool. Just under 15 km to the Cape house. Substantial link road works already completed (£15,000 allocated) but this appears to be an area where link works may not be effective. No port option. No airstrips.
- (c) Salvador. 7 residents. 55-60,000 kg of wool. Nearly 30 km. Track currently very tide-dependent, link works of strictly limited value. Sea-truck port option; good jetty. Airstrip.
- (d) Bombilla. 4 residents. 8-10,000 kg of wool. Approx 10 km to TI-Hope Cottage stretch of the road. Link works probably effective. No port option. No airstrip.
- (e) Rincon Grande 4 residents, 30-35,000 kg of wool and Horseshoe Bay 4 residents, 20-25,000 kg of wool. 10 km from road to Horseshoe, a further 5 km to Rincon Grande. Extensive link works and grading already carried out. Further link works probably adequate. Already cart wool and freight to/from Stanley. No airstrip.
- (f) Johnsons Harbour. 5 residents. 50-55,000 kg of wool. Just under 10 km from Port Louis. Some link works completed between Port Louis and Johnsons. Lot of hard ground, more extensive link works probably adequate. Sea-truck port option, good jetty. Airstrip now unlicensed.
- (g) Long Island. 2 residents. 12-15,000 kg of wool. Approx 5 km from road. Relatively minor link works required. No port option. No airstrip.

- (h) Murrell Farm. 6 residents. 8-10,000 kg of wool. Approx 8 km from Stanley. Very poor ground conditions, no port option (though small boat access is possible). No airstrip.
- (i) Wreck Point. 2 residents. 14-16,000 kg of wool. Link road (5 km) to Burntside-SC under construction (self help). Sea truck port at Ajax Bay. No airstrip.
- (j) Moss Side. 2 residents. 23-25,000 of wool. 2-3 km to PSC road over poor ground.

It is estimated that it would take about 8 seasons with a full construction team to link all of the above areas to the spine roads such that the tracks were durable and could be used all year round.

In the south east area a link road has been requested to the National Stud Flock site at Saladero. This would be approximately 5 km from the Newhaven road and could be build concurrently with that road.

3.1.3 Spine Roads - West

The 1989 plan for spine roads on the West was

- Port Howard - Chartres
- Chartres - Fox Bay
- Chartres - Hill Cove

To date the road has been completed from Port Howard to Fox Bay with spurs into Saddle Farm and Chartres, and a road has been built between Fox Bay East and West. A small section, from the road between Saddle and Chartres towards Hill Cove has been commenced.

To complete the West spine roads requires the continuation to Hill Cove with a link road to Roy Cove, and then from Fox Bay to Port Stephens. Given the population distribution a road from Little Chartres to Dunnose Head/Shallow Harbour may also be considered.

The whole programme, including Shallow Harbour, would take approximately another 6 seasons and complete spine roads throughout West Falkland.

3.1.4 Link Roads - West

A number of link and advance works have been completed on the West, though there is still an amount to do. The West Flying Squad has had difficulty in finding suitable operators, and has more recently been diverted to the important Fox Bay jetty project.

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The works remaining are (in no particular order):

- (a) Sheffield Farm. 3 residents. 15-18,000 kg of wool. About 7 km to the road near Teal River. Ground conditions generally poor. Poor port option (seatruck onto the beach). No airstrip.
- (b) East Bay. 2 residents. 14-16,000 kg of wool. Just over 10 km north to the Dunnose Head road (if built) or about 17 km south to the Fox Bay-Leicester Falls road. Link works probably adequate southwards, northwards unknown but thought to be difficult. No port option. No airstrip.
- (c) Spring Point. 2 residents. 17-19,000 kg of wool. Approx 12 km to road near Leicester Falls. Link works probably adequate. Sea truck port option. Good airstrip.
- (d) Philomel Farm. Residents live in Fox Bay. 18-20,000 kg of wool. Just over 5 km to the Little Chartres-Fox Bay road. No port option. Link works probably adequate.
- (e) South Harbour. 3 residents. Just over 5 km to the Port Stephens road. Link road works probably adequate. No port option (already carts wool to Port Stephens). No airstrip.
- (f) Main Point 2 residents, 20-22,000 kg of wool and Shallow Bay 4 residents, 17-19,000 kg of wool at 22 km and 17 km respectively from Hill Cove (along the same track). Link works generally adequate. No port options. No airstrips.
- (g) Dunbar. 3 residents. 22-24,000 kg of wool including Hope Harbour. Approx 18 km from Roy Cove road. Passes through Port North about 5 km from Roy Cove 16,000 kg of wool, 1 resident. Limited link works could be considered. Sea truck port in sheltered harbour. Poor airstrip.
- (h) Port Edgar 5 residents, 23,000 kg of wool. 15 km respectively from the Fox Bay-Port Stephens road over very poor ground. Sea truck port. New airstrip.
- (i) Albemarle. 4 residents. 20,000 kg of wool. 20 km from road near Port Stephens. Very poor ground. Sea truck port. No airstrip.
- (j) Westley. 2 residents. 10,000 kg of wool. 5 km from Hill Cove road. No port or airstrip.

It is estimated that it would take 10 seasons with a full construction team to complete all the above works to a standard capable of durable all weather use.

3.1.5 Achievements Against Targets

The roads programmes on both East and West have very largely met the plans laid down in 1989, and in several instances exceeded them. One of the principal difficulties for planners and builders has been to keep up with ever-increasing expectations and demand, whilst the self-help concept has dwindled (with some notable exceptions). Nevertheless it is possible to foresee completion of the whole roads programme (at least in this phase of creating roads where none previously existed) by the year 2006 at enhanced rates of investment and current building standards and speed.

The one notable exception to achievement of targets which has been recommended in every economic and transport study since Shackleton but has not yet been provided, is the linking of the two road systems with a cross-the-Sound sea link. This is considered further below.

3.2 Coastal Shipping

3.2.1 Vessels

Although the Internal Transport Action Plan recommended that the coastal shipping operation continue on the basis of the Monsunen and Forrest, at least until the camp roads system was well established, this proved not to be practicable. The marine surveyors who examined the Monsunen in 1990 recommended that she be replaced by 1992 since it would become increasingly expensive to keep her in service and to pass future surveys.

The replacement exercise began with FIC (the managers of Coastal Shipping Ltd) seeking tenders for new or second hand vessels for purchase or charter; during this process the question was addressed of who should own the new vessel (if she were purchased) - FIC on behalf of CSL or FIG to charter to the shipping managers - and who should manage the service. In the event the following decisions were made

- (a) a new vessel should be purchased by FIDC to provide a service for at least five years;
- (b) there should be a "beauty parade" to appoint a new coastal shipping operator in place of CSL (since operation by a Company Limited by Guarantee was no longer considered appropriate);
- (c) the new operator should take part in the selection and purchase of the new vessel;

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- (d) Byron Marine Ltd were selected in February 1992 to operate the coastal service;
- (e) the M V Tamar FI (previously the Leca Vest) was purchased, modified and delivered to commence service in January 1993 at a total cost of £1.45m;
- (f) the M V Monsunen was sold by the FIC and left the Islands;
- (g) M V Forrest was laid up, but retained as a standby and back-up vessel.

3.2.2 Operating Patterns

Since that time M V Tamar has been operating roughly an 8-week cycle of calls to all ports, including a trip to Punta Arenas (a copy of the 1995 schedule is attached); the Forrest has rarely been required but has been available for some additional works (Hill Cove jetty, baseline surveys) and for fill-in during the Tamar maintenance period.

Tamar has operated a number of cross the sound ferry trips (from Port San Carols to Port Howard) at key times like Christmas, Sports Week and Farmers Week.

The change from Forrest/Monsunen to the single vessel operation has maintained operating costs at around previous levels, has provided an enhanced frequency of calls and developed the link with Punta Arenas. However the deeper draft of the vessel has increased the amount of sea-truck work to some extent, and the success of the road programme has removed several ports from the list of calls. The following is a comparison between port classifications in 1991 and the present classifications.

A Ports

1991 - Ten
 Lost to road programme - Three (Goose Green, Douglas, Green Patch)
 1996 - Seven

B Ports

1991 - Ten
 Lost to road programme - Two (Fitzroy, Teal Inlet)
 Down-graded to C ports - Three (Salvador, Speedwell, Weddell)
 Up-graded from C ports - Two (Saunders, Hill Cove)
 1996 - Seven

C Ports

1991 - Twenty five

Lost to road programme - Six (Bluff Cove, Rincon Grande, Horseshoe Bay, Port Louis, Port Sussex, Packes Port Howard)

No longer used - One (Keppel)

Down-graded from B ports - Three (Salvador, Speedwell, Weddell)

Up-graded to B ports - Two (Saunders, Hill Cove)

New ports/calls - Five (Spring Point, Port Edgar, Albemarle, Sheffield, Double Creek)

1996 - Twenty four

Total ports served in 1991 - Forty five

Total ports served in 1996 - Thirty eight

The greatest single change to operating patterns within the Islands has been the substantial reduction in wool carried due to movements by road. The following are clearly indicative of these changes

Table 1 - Wool Carriage by Sea

1989/90 - 2,108,100 kg (7,592 bales)

1990/91 - 2,235,800 kg (8,773 bales)

1991/92 - not available

1992/93 - 1,819,541 kg (7,360 bales)

1993/94 - 1,816,584 kg (7,397 bales)

1994/95 - 1,695,149 kg (6,892 bales)

1995/96 - 1,482,852 kg (6,241 bales)

Expected 1996/97 - 1,025,500 kg (4,250 bales)

Trends in general freight movement are much more difficult to identify due to changing circumstances. For example whilst several East farms now haul the bulk of their freight and fuel overland reducing farm demand, servicing the road programme itself on the West has substantially increased total fuel deliveries. FIG, EDF and Stabex grant schemes involving the delivery of fencing, building and jetty materials to farms has also affected the shipping patterns. In broad terms general freight volumes have been constant over the last 4 years.

3.2.3 Jetties

One of the criticisms of the '89 Action Plan was that several ports in regular use were kept in poor state of repair; it was recommended that these ports should be penalised by way of increase in tariffs for those that did not keep jetties well repaired (to assist both the efficiency and the safety of the shipping operation).

In the event the onset of poor wool prices made it difficult to implement such a policy. Major repairs were carried out to the Hill Cove jetty through self help and funds provided by FIDC. Proposals were submitted to the EC funded Stabex scheme in January 1994 for jetty repairs to be funded from the 1990 and 1991 Stabex transfer. This was eventually approved in August 95 and materials ordered on the basis of a jetty survey carried out by Byron Marine.

The principal jetties to be repaired are those that will remain in use for the foreseeable future (key ports, islands and mainland farms which have no access to the road network), or those which will not have any connection to the road for some years. A status report on repairs as of 6.5.96 is attached.

In addition major repairs are being undertaken at Fox Bay East to provide a key port facility for the use of the central and south areas of West Falkland.

As a checklist of ports which require continuing good facilities, the following will remain in use in the immediate future and ship in excess of 20,000 kg of wool per annum.

Table 2 - Ports in Continuing Use (more than 20,000 kg of wool)

<u>West Falkland (Mainland)</u>	<u>Approx kg of Wool</u>
Port Stephens	60,000
Fox Bay	195,000
Port Howard	325,000
Hill Cove/Roy Cove	145,000
Dunbar	22,000
Shallow Harbour/Dunnose Head	36,000
Albemarle	20,000
Port Edgar	23,000
<u>East Falkland (Mainland)</u>	<u>Approx kg of Wool</u>
North Arm	250,000
San Carlos	80,000
Walker Creek	115,000
Salvador	55,000
Johnsons Harbour*	50,000

* Johnsons may truck overland next season.

<u>Islands</u>	<u>Approx kg of Wool</u>
Weddell Island	27,000
Saunders Island	36,000
Pebble Island	36,000
Lively Island	20,000
Speedwell Island	22,000

The Stabex Steering Committee recommended to Exco in May 1995 that in order to make the proper use of the proposed new road system that a new deepwater jetty should be built at Port Howard and a terminal at Newhaven using the 1993 Stabex funds. Executive Council approved the Port Howard proposal, but not that for Newhaven since they were at that time not yet convinced that a port at Newhaven and a ferry service was required. To date no further action has been taken on the Port Howard jetty until it is clear that such an investment would be used and is to the benefit of the farming community.

3.2.4 Punta Arenas

In addition to its coastal duties the Tamar has made regular trips to Punta Arenas, carrying scrap and live sheep from the Falklands and bringing general cargo, asphalt and fuel from Chile.

This activity has been useful to the Falklands in that it has stabilised trade with Chile (trips previously run by Chilean charterers had been spasmodic and unreliable) and the trade has made a positive return to Byron Marine.

It should be recalled that in its earlier deliberations on which vessel to acquire for the Falklands coastal trade the Transport Advisory Committee and Exco had to compromise between a number of potential demands for the vessels' service. The two elements which were most difficult to reconcile were the ro-ro capability for easy, flexible operation across the Sound, and sea-going capability for the trip to Punta Arenas.

If the Falklands are to continue with effectively one vessel this compromise will remain, though now with the development of roads and the jet air alternative to Santiago, it may be that the pendulum has swung rather more towards the provision of a ferry service than the freight alternative to Punta Arenas. This is an area of choice and compromise to which the TAC will require to give continued thought.

The Punta trade has grown since Byron Marine started from effectively a zero base in 1993.

General cargo has risen thuswise (on average)

Table 3 - Cargo from Punta Arenas

1993	102 cubic metres per voyage
1994	204 cubic metres per voyage
1995	163 cubic metres per voyage
1996	198 cubic metres per voyage

with an average of 250 cubic metres of either bulk fuel or asphalt making up a full cargo.

3.3 Air Service

3.3.1 Aircraft

There has been less visibly dramatic change in the Falkland Islands Government Air Service (FIGAS) than there has been in either land or sea transportation. In 1989 there were 3 Islander passenger aircraft, now there are 4. The principal change has been in non-passenger fisheries patrol aircraft where the Dornier has been disposed of and replaced by two Islanders fitted out for fisheries patrol duties.

This has no direct effect on the passenger service, though there is clearly a financial benefit in complementary spares holdings and greater engineering efficiency.

3.3.2 Flying Patterns

There has been a slow but continuing change to the pattern of flying. The following table which shows the summary of landings for the period 1989-1995 demonstrates these changes.

On East Falkland as the roads have pushed outwards so the landings at several airfields have substantially decreased or in some cases ceased altogether. As the north camp road progressed, Green Patch and Port Louis ceased to be used in 1990 and are now unlicensed, and use of Johnsons Harbour tailed off to zero by 1992. Teal Inlet effectively ceased to be used in 1993 and use of Douglas Station is down to 25% of its 1989 usage. A similar reduction can now be expected at Port San Carlos. At Darwin usage declined dramatically from 1993 when the road arrived to now stand at 38% of its 1992 usage.

On the other hand there has been a correspondingly large rise in landings at MPA as use of helicopter hours for R & R continues to reduce, and passengers switch to FIGAS.

TABLE 4 - FALKLAND ISLANDS GOVERNMENT AIR SERVICE

SUMMARY OF LANDINGS

STATISTICAL PERIOD 1989-95

	B LI ES AL KA EN ND	DS OT UA GT LI AD SN	D A R W I N	GI ES OL RA GN ED	GP RA ET EC NH	J OR HA NR SB OO NU SR	LI IS VL EA LN YD	P LA FI MAR OSP UAD NNR TTI	N O RA TH HM	P OR TA R SL AD NS	L PO DU AD RI TS	S A LV AA LL IA ON ND	S E AI LL IA ON ND	C A KR SL AO NS	S L P E S DL WA EN LD	I AC LR KE EL AE RK	TOTALS	
1989	48	104	196	0	48	70	39	304	138	103	36	152	212	88	45	60	34	1677
1990	38	85	193	7	3	33	37	245	162	97	2	143	238	90	66	40	34	1513
1991	27	90	187	0	0	10	39	450	157	92	0	114	228	155	56	25	36	1666
1992	12	88	214	0	0	0	88	384	137	108	0	76	285	176	54	24	26	1672
1993	27	52	124	0	0	2	52	681	139	96	0	96	266	165	47	9	16	1772
1994	41	25	114	0	0	1	84	767	162	79	0	76	284	137	55	2	29	1856
1995	38	26	82	0	0	2	97	772	145	58	0	85	285	148	55	1	38	1832

	B RI ES AL VA EN RD	C AI RS CL AA SN SD	H A R T R E S S	D U N N H O E A R S	D U N N H O E A R S	F O X B A Y	G OI LS DL IA NN GD	R C IO LD LV LE	K I ES PL PA EN LD	I S L NA EN WD	P I ES BL BA LN ED	H O PW DA RR TD	S T EP PH DE TS	R O Y C O V E	S A UI NS DL EA RN SD	I SS EL DA GN ED	S PP RO II NN CT	W EI DS DL EA LN LD	I PS WDL EIA SNN TTD	TOTALS
1989	53	83	153	75	93	381	17	187	23	13	223	450	97	89	95	12	0	29	42	2225
1990	51	92	188	98	104	403	27	225	58	40	292	475	138	114	149	7	0	63	77	2699
1991	73	95	189	94	69	414	32	199	44	49	280	480	140	99	158	6	0	68	137	2704
1992	45	63	194	94	66	441	20	221	4	31	305	412	143	102	184	9	0	78	117	2590
1993	38	72	182	74	70	365	34	229	0	49	327	380	118	105	287	15	1	73	120	2612
1994	59	104	172	76	60	356	11	253	0	50	365	369	135	102	275	11	20	88	149	2719
1995	55	137	152	79	90	403	5	214	0	64	395	389	135	48	271	5	30	82	198	2812

MPA now accounts for 42% of all the landings on East Falkland, with Sea Lion relatively constant at 15%, North Arm and San Carlos at 8% each; these four principal landing sites account for 73% of all landings.

Total landings on East Falkland have continued on a gentle upward trend, having risen about 7% over the mean of the 7 years, to 12 regular destinations (down from 17).

The patterns on the West are quite different with 17 regular destinations, down from 19. There have been no dramatic changes of use on the scale of the East. There are three principal users, Fox Bay, Port Howard and Pebble (14% each) with Saunders, Weddell and Hill Cove making a second tier (7-10%) and Carcass, Chartres and Port Stephens each having 5%. These 9 destinations account for 82% of landings.

There are as yet no signs of change in the pattern of use due to road construction (except the amalgamation of the Fox Bays), because there is currently no financial incentive for passengers to drive to another airfield.

Total landings on West Falkland have also increased on a gentle upward trend, having risen around 7% over the mean of the last 7 years.

The second table of movements shows total passengers moved by category, sub-category and total. Annual total passengers carried having dropped away, in 92/93, have recovered in 1995 to be similar to 1990 levels.

By category the trends differ. FIG usage shows a parabolic curve of increased use and then decline, general public use shows a general decline with a recent minor upturn, whilst tourist usage shows a constant yearly increase.

The percentages carried by category are

	<u>'90</u>	<u>Average</u> <u>90-95</u>	<u>'95</u>
Government	17	20	14
Residents (private)	60	45	43
Tourists	23	35	43

Clearly the significant growth area is in tourism, most particularly tourists from MPA, principally to Sea Lion, Weddell, Saunders, Port Howard and Pebble. One would expect to see this increasing concentration of passengers around fewer destinations begin to show efficiencies in operating results.

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Table 5 - FIGAS - Summary of Passenger Usage 1990-95

	1990	1991	1992	1993	1994	1995
Medical - staff	229	333	226	187	163	190
- patients	187	197	335	315	320	158
Education - staff	189	264	250	174	187	155
- students	290	284	257	273	292	118
Agriculture - staff	51	69	36	28	49	22
- other	71	32	30	45	49	57
Councillors	36	31	34	33	38	49
FIG - other	197	299	391	288	306	278
Sub-Total	1499	1720	1881	1603	1681	1215
Shearers	132	178	182	197	164	142
OAP	26	98	126	155	145	105
Children 4-7	195	214	157	151	166	285
Children 8-15	532	614	470	417	414	603
Stanley Residents	2826	1656	1275	1286	1401	1403
Camp Residents	1360	1306	1005	819	904	1033
Sub-Total	5071	4066	3215	3025	3194	3598
Tourists Local	153	230	224	60	50	82
Tourists Overseas	1249	1199	1390	950	857	1228
Military	533	1108	1073	2290	2503	2292
Sub-Total	1935	2537	2687	3300	3410	3602
TOTAL	8505	8323	7783	7928	8285	8415

Table 6 - FIGAS - Summary of Freight Carriage 1992-1995

	1992	1993	1994	1995
Freight Out (kg)	51856	44268	38267	41879
Freight In (kg)	10717	15264	9829	11596
Mail Out (kg)	3421	5876	5174	7293
Mail In (kg)	1082	1973	1596	1948

Since freight and mail is largely a by-product of the passenger service it has no major effect on flight patterns.

3.3.3 Airstrips

The large majority of camp airstrips are traditional grass strips, though in recent years clay strips have been prepared at Walker Creek, Saunders Island and Fox Bay.

There have been no new airstrips constructed or licensed on the East in recent years, though a new strip is in preparation on Lively Island and plans are in hand (though at an early stage) for an improved site on Sea Lion Island.

On the West the construction of the new Fox Bay airstrip (opened 1995), together with the link road, has enabled an amalgamated use for the two settlements and a much improved facility. At Port Howard the introduction of the Purvis Pond strip in 1990 made landings at Port Howard more reliable, but the principal settlement airstrip is still rather rough.

Two new strips have been opened at remote locations, Spring Point (1994) and Port Edgar (1996). New sites are being prepared at Dunbar and Albemarle.

Funds utilised in airstrip improvements (excluding fire equipment) over the years have been relatively modest, averaging just over £27,000 per annum (about the cost of 1 km of road).

4. SUMMARY OF RESOURCES COMMITTED TO THE TRANSPORT SYSTEM

4.1 Roads

4.1.1 North Camp Road

Plant and Equipment - £1.2m (approx cost new)

Personnel - 12-16

Cost to Date - £1,638,926 (excluding Plant and Equipment cost)

4.1.2 West Road Contractor

Plant and Equipment - £1.2m (approx including "free issue" from PWD)

Cost to Date - £1,475,212

4.1.3 Link Roads

Flying Squad Plant and Equipment - £275,150

Total Link Road Costs to Date - £1,429,210

Ancillary pieces of old PWD plant - no transfer cost

4.1.4 L'Antioja - Darwin Road

Total Cost - £1,995,919

4.1.5 Stanley Based Resources

Roads Engineer - £30,000 pa (est)

Supervision - £30,000 pa (est)

MPA Road Maintenance 1986-1996 - £486,293

MPA Road Improvements (to 6/95) - £874,614

MPA Road Resurfacing - £411,521

4.2 Sea Transport

M V Tamar FI - £1.45m (1993)

M V Forrest - £30,000 (nominal value)

Operating subsidy, Byron Marine - £325,000 pa

Maintenance cost M V Forrest - £15,000 pa

Jetty Repairs and Maintenance (externally funded) - £200,000

↗ £1.48m (assets)

Total Capital Employed - £1.68m

↘ £200k (infrastructure)

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4.3 Aviation

4 Islander Aircraft - £1.56m
Stanley Airport - £5m (estimate)
FIGAS Annual Nett Cost - £330,000
Civil Aviation Annual Cost - £140,000
Personnel (FIGAS & CAA combined) - 28

Total Capital - £6.56m
Total Recurrent - £470,000

4.4 Overhead Costs

There are undoubtedly substantial additional costs to maintaining the transport network, but which cannot be specifically allocated. Time is applied from the following FIG departments:

PWD	Director and staff, Design Section, Central Stores, Plant and Vehicles, Asphalt Plant, Quarry
Fisheries	Port Control
Customs	Import Clearance (Tamar)
Secretariat	Economic Advisor, Legal Department
FIGAS Management Group	
Byron Marine Users Group	
FIGAS Users Group	
Transport Advisory Committee	
FIDC	

4.5 Summary

Capital Invested - £19,226,836
Total Recurrent Cost - £870,000 per annum

5. ROADS, LINK ROADS AND TRACKS - FUTURE PROGRAMME

5.1 Key Issues

The key issues which affect the future programme for land transportation are

- (a) levels of resources committed
- (b) methods of prioritising construction
- (c) standards and cost of construction
- (d) future road usage
- (e) coastal shipping tariffs
- (f) deep water jetties at Port Howard or Fox Bay, and Newhaven

These are each put into context and considered further below.

5.2 Level of Resources

- 5.2.1 It is self evident that the greater the level of resources committed to road construction the faster the whole programme can be completed (provided the programme does not continue to expand in terms of length and quality of roads to be built!). The flying squad concept has however demonstrated to some extent that the way in which additional resources are applied needs careful consideration; for a significant increase in construction capability to be achieved significant step changes in resource levels are required, well beyond the capability of the flying squads.

At present one major construction team on each island supported by flying squads cannot keep up with apparent demand, with strong pressure for link roads to be completed to a higher standard in areas where spine roads have been completed. This is putting pressure on the construction of the spine roads themselves in East Falkland.

It should also be noted that due to the general labour shortage in the Falklands additional teams cannot necessarily be mobilised at the same cost as the existing teams. If for instance there were to be two additional teams, one on East and West, they would inevitably draw labour from the existing teams (which would have to be replaced at possibly higher costs), and the balance of labour would have to be imported. Whilst direct labour rates may be similar, overheads for recruitment and transport would increase overall cost.

- 5.2.2 The above is not intended to argue against increased allocation of resources, but to recognise that if proposals are adopted to use two full teams on each island to build higher standard link roads, that is a fundamental change in policy from the original concept of spine and self-help links, to publicly funded links to all individual farms.

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This will also cause us to re-look at the fundamentals of prioritisation.

5.2.3 Method of Prioritisation

In April '94 the Transport Advisory Committee put to Executive Council the following priority options for construction of roads

- (a) greatest benefit to the most number of people (most persons or most farms or most kilos of wool per kilometre of road)
- (b) greatest benefit for the least cost (as above but priority based on lowest cost per kilometre first)
- (c) the most difficult pieces of camp first or
- (d) the easiest pieces of camp first (most road for least cost)
- (e) linkage of main population centres.

The recommendation which was accepted by Exco was that

- The priority for main road construction should be to link the principal population centres with the main roads
- The parallel construction of link roads should be based on greatest benefit to the most number of people.

The relatively recent decision on the West to continue the main road works towards Hill Cove/Roy Cove and then switch to Fox Bay to Port Stephens, with link roads being constructed as they are able by the flying squad is in accordance with the existing Exco policy.

The decision to leave the PWD East road gang (and all its resources) in the north camp to complete link roads, without having made proper provision for the continuation of the spine road south from Darwin to Cobbs Pass and North Arm, virtually stands the policy on its head by giving priority to link roads on the basis that it is cheaper to construct them whilst the road gang is in the area. Whilst this is a legitimate approach (it was offered as option (b) above) it is not the one selected by Exco, nor has there been a formal change of policy.

Only through a major increase in resources (financial, plant and manpower) which has not yet been fully committed will a major disruption of the main road programme on the East be avoided.

The TAC and Executive Council are recommended to affirm the primacy of main road construction over link road construction, AND

EITHER relocate the north camp team to Darwin to continue the main road system south OR allocate sufficient funds to the main roads budget to enable a contract to be let which will be of sufficient size to encourage a contractor to mobilise for the works (three years work would probably be necessary).

5.2.4 New Considerations on Priorities

The clarification by Exco in April '94 as to how road construction priorities should be set was firmly based on first serving the existing economic activities of the rural areas - ie sheep farming.

Since that time the continuing low wool prices have heightened the need for more economic diversification in camp, which in turn has put more pressure on road and link road demand to enable farms to access the market for alternative produce or services. The firm agreement to build the abattoir has opened up new potential for farms to supply sheep and cattle for slaughter; to do so they need to be able to move their animals to the abattoir cost effectively and at least possible stress to the animal. This particular element is considered further in Section 6 where the need to provide a facility at Newhaven is highlighted.

A further element of diversification which has floated on the periphery of road priorities for some time is tourism. Many farms nowadays rely on additional income from tourism activities; renewed consideration is required on how future enhanced income to farms from tourism or any other diversification activities should be treated in the evaluation of priorities.

This is a key item of policy for consideration by Executive Council. Should the transport system not be responsive to rural development policies? And what is the weighting between supporting existing activities and future activities?

A number of factors have been suggested as being elements of consideration to be included in road prioritisation. They are:

- (i) Numbers of people served (families? individuals? economic units?)
- (ii) Wool quantities to be shipped
- (iii) Alternative facilities available (port, airstrip)
- (iv) The ground conditions for transport and road building

- (v) Proximity to other road works (ie for use of existing accommodation facilities)
- (vi) Other economic opportunities created or enhanced, eg tourism, alternative produce, livestock
- (vii) Total road (or track) usage (by others)

Although it is certainly possible to rank the above in relative importance, and to devise a points system for ranking priorities, it is not evident that it would produce a more appropriate and cost effective result than intuition, common sense, and good old fashioned argument. The decision may ultimately be between transparency and practicality.

Executive Council does however need to give guidance to the TAC on the relative importance of each of these factors and particularly whether new or alternative activities which create more economic benefit to the rural areas should have any priority over supporting the status quo.

5.3 Standard and Cost of Construction - Spine Roads

- 5.3.1 Road building in the Falklands has to some extent been experimental over the last few years; whilst the Mount Pleasant road was fully engineered and can accommodate any level of traffic and weight, it was massively expensive.

The task for other roads has been to build them to a standard which will be durable given known or anticipated levels of traffic, which can be upgraded without complete rebuilding should usage increase substantially, but at the same time keeping cost per kilometre to a level that is consistent with fund availability.

Broadly the parameters for the standard and cost of roads are

- width of carriageway
- thickness of fill
- geometry (control of gradients and curves for speed/safety)
- base preparation.

In terms of future upgrading, the width of carriageway can normally be increased without disturbing the existing works, and given a suitable sub-base thickness of fill can be increased to improve axle loadings. What is critical in the first phase of construction is that the geometry of the road is appropriate for its likely uses (ie curves and gradients are designed for future speeds and loads) and the sub-base is strong enough (both of these latter elements can only be changed by digging up the existing road).

5.3.2 By way of illustration the following figures give some idea of both the range of engineering options, as well as the development of construction techniques.

<u>Road</u>	<u>Carriageway Width</u>	<u>Approx Cost/km</u>
MPA	6m	£320,000
MPA Darwin	5m	£60,500
Estancia Phase I (86-88)	3m	£68,000
Estancia Phase II (89)	3m	£35,000
North Camp (94/95)	3m	£17,626
West Road (94/95)	3m	£15,744

In the above examples the method of construction in the first four instances involved very substantial digging out of often deep peat to reach a hard base. More recent experience on the North Camp and on the West, now that there is much more extensive use of geotextiles over areas of deep peat shows costs reduced to an average cost per kilometre on East and West over the past four years of around £19,000 per kilometre. The reduction between phase II and III on the Estancia road also reflects the switch from quarry to borrow materials.

The as built construction figures for the last four seasons are:

North Camp Road

	<u>Cost £</u>	<u>km</u>	<u>£/km</u>
92/93	260,320	10.5	24,792
93/94	299,846	20.5	14,627
94/95	299,649	17	17,626
95/96	360,000	14.5	24,828
Average	304,953	15.6	19,548

West Roads

92/93	289,812	9.5	30,507
93/94	333,794	19.5	17,118
94/95	330,617	21	15,744
95/96	520,989	27.4	19,014
Average	308,803	19.4	19,010

5.3.3 Clearly any inferences drawn should be treated with some caution, since there are many variables in total cost, notably ground conditions, major water-crossings and the proximity of suitable materials. However as a guide to future construction costs on both East and West these averages are realistic as direct costs of construction, within existing locally available labour resources.

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They do not however show the full cost since there is no element of plant cost/depreciation, nor is the full cost of plant maintenance easily drawn from FIG accounts. A reasonable estimate of the first cost of plant employed on each section of works is £1.2m, which, given an expected life of 10 years, gives an annual plant cost of £120,000. Adding to this an estimated £20,000 for additional plant maintenance, the annual cost of £140,000 divided by the average build of 17.5 km per annum gives an additional cost of plant and maintenance of £8,000 per annum, giving a total current average construction cost of £27,000 per km.

5.3.4 The standard of construction being produced on East and West roads at present are sufficient on the East to take 5T axle loads, and on the West 3T-5T axle loads (this is dependent on the sub-base preparation and depth of fill applied).

5.3.5 It is recommended that the design axle weight for all spine roads should be not less than 5 tonnes given likely future movement of wool and other heavy loads (cattle trucks, fuel, etc). This would require design specifications of 300mm (minimum) of fill where organic materials had been removed, or 500mm (minimum) where geotextiles had been laid as the sub-base. Since this is not dissimilar to existing design specifications and/or as built roads, this clarification of standard should not affect current programming and cost projections. If for any reason it were concluded that depths of fill were not currently sufficient for 5T axle weight it should be noted that fulfilling an enhanced specification might lead to slower rates of construction and higher cost per kilometre. The options would be:

(a) to continue at existing specifications and upgrade later according to demand; or

(b) upgrade specifications and increase the programme length and cost.

It is recommended that gradients only be modified where necessary for reasons of safety or durability of the road surface and that curves be designed to accommodate speeds up to 40 mph.

5.4 **Standard of Construction - Link Roads**

Some confusion has arisen in the past 3-4 years about the definition and standard of link roads or link tracks, the responsibility for maintenance and who is entitled to use them. This report does not deal with the usage or maintenance questions, but is concerned with standard of construction.

5.4.1 The original concept of the link road or link track was set out in Terms of Reference for Advance Works and Link Roads dated 25.1.91 and adopted by

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Executive Council at its meeting of January '91. The concept of the link road was essentially self-help (though there was provision for independent contractors to carry out link works, and in a later amendment for PWD to undertake works). The full terms of reference are attached as Annex 4, but the key elements were

- (a) A landowner or tenant for his own use, or a neighbouring landowner or tenant who is a regular user of the track who has received the consent of the landowner, may apply for funds to upgrade a piece of camp track, bridge, culvert or crossing which is not on the proposed Camp Road route, but which will connect a recognised farm house or community to the proposed Camp Road route.
- (b) He must demonstrate that there is a need, for the purposes of free passage of freight and/or passengers, to upgrade that stretch of track, bridge, culvert or crossing.
- (c) The proposed works are, in the opinion of the PWD, to a design and construction standard sufficient to withstand the normal usage of the track.

5.4.2 There was never any anticipation at the time that these terms of reference were written that there would be demand (at least at this stage) for publicly funded continuous link roads, or that FIG would agree to these prior to completion of the spinal network. There are therefore no terms of reference or design standards for continuous link roads (they are as likely as not to be determined by the size of the construction traffic).

It is recommended therefore that TOR be put in place immediately, with reference to the agreed method of prioritisation, and taking note of likely usage and ground conditions; link roads may be

- (a) continuous where it is evident that due to ground conditions non-continuity would create difficulties of access or egress from built sections
- (b) non-continuous where there are good hard sections usable in all weathers which would not deteriorate due to the existence of the made up sections
- (c) of not less than 2 tonne axle load, single carriageway width
- (d) conditions may be placed on their use by the general public
- (e) maintenance responsibilities should be made clear

- (f) the extent of any input (labour, machinery, materials) by the landowner and whether any payment may be made from public funds for these.

5.5 Likely Future Usage of Roads

The following tables show likely future usage of roads for the carriage of wool, showing possible scenarios based on one, two or four key ports on the West and one, two or four key ports on the East, and considering the possible effect/advantage of all wool collection for northbound shipping being based at Fox Bay/Port Howard, Newhaven and Stanley.

TABLE 7 - POSSIBLE WOOL MOVEMENTS - EAST FALKLAND

LOCATION	FARM	KILOS	km TO PORT			KILOMETRE TONNES			OPTIMUM KM TONNES	
			TO PSC	TO STY	TO NHV	TO STY	TO NHV	TO NA		
NORTH ARM	NORTH ARM	250,000	-	150	60	-	37,500	15,000	NIL	
WALKER CREEK	WALKER CREEK	115,000	-	150	60	-	17,250	6,900	6,900	
GOOSE GREEN	GOOSE GREEN	285,000	-	100	20	-	28,500	5,700	5,700	
FITZROY	FITZROY	90,000	-	50	80	-	4,500	7,200	4,500	
SAN CARLOS	PORT SUSSEX	12,500	40	110	40	-	1,375	500	500	
	WRECK POINT	15,500	35	120	50	-	1,860	775	543	
	BLUE BEACH	45,000	30	120	50	-	5,400	2,250	1,350	
	KINGSFORD VALLEY	18,500	30	120	50	-	2,220	925	555	
	GREENFIELD	27,000	20	130	60	-	3,510	1,620	540	
PORT SAN CARLOS	SMYLIES	30,000	NIL	100	80	-	NIL	3,000	2,400	NIL
	RACE POINT	24,000	NIL	100	80	-	NIL	2,400	1,920	NIL
	MOSS SIDE	24,000	5	100	80	-	120	2,400	1,920	120
	ELEPHANT BEACH	20,500	25	90	90	-	513	1,845	1,845	513
	CAPE DOLPHIN NEW HOUSE	19,500 15,500	30 20	95 80	95 80	-	585 310	1,852 1,240	1,852 1,240	585 310

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DOUGLAS	BOMBILLA	8,500	40	80	100	-	340	680	850	-	340
	HOPE COTTAGE	26,000	30	70	90	-	1,780	1,820	2,340	-	1,780
	HOME FARM	14,500	30	70	90	-	435	1,015	1,305	-	435
	KINGS RIDGE	24,000	30	70	90	-	720	1,680	2,160	-	720
	GIBRALTAR STATION	56,500	50	90	110	-	2,825	5,085	6,215	-	2,825
TEAL INLET	EVELYN STATION	17,000	45	55	105	-	765	935	1,785	-	765
	TEAL INLET	22,000	45	55	105	-	990	1,210	2,310	-	990
	RIVERVIEW	16,000	55	45	115	-	880	720	1,840	-	720
NORTH EAST CAMP	ESTANCIA	13,500	65	35	115	-	878	473	1,553	-	473
	LONG ISLAND	12,500	-	45	125	-	-	562	1,562	-	562
	MOUNT KENT	9,500	-	45	125	-	-	427	1,187	-	427
	BROOKFIELD	11,500	-	50	130	-	-	575	1,495	-	575
	PORT LOUIS	42,000	-	55	135	-	-	2,310	5,670	-	2,310
	JOHNSONS HBR	51,000	-	65	145	-	-	3,315	7,395	-	3,315
	HORSESHOE BAY	21,000	-	60	140	-	-	1,260	2,940	-	1,260
	RINCON	30,000	0	65	145	-	-	1,950	4,350	-	1,950
	GRANDE MURRELL	9,000	-	10	130	-	-	90	1,170	-	90
OTHERS	MULLET CREEK	2,000	-	10	110	-	-	20	220	-	20
	BUTCHERY	1,000	-	NIL	120	-	-	NIL	120	-	NIL
	BLUFF COVE	11,000	-	30	90	-	-	330	990	-	330
	RIVERSIDE	4,500	-	45	75	-	-	202	337	-	202
	SALADERO	4,000	0	120	10	-	-	480	40	-	40
TOTALS								139,991	99,981		42,245

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ISLANDS

LIVELY	21,000
BLEAKER	10,000
SPEEDWELL	22,500
GEORGE/ BARREN	7,500
GREAT/TYSSEN/ SWAN	9,000
TOTAL	70,000

TABLE 8 - EAST FALKLAND WOOL - SUMMARY

TOTAL ROAD TRANSPORTABLE WOOL	1,400,000 kg
TOTAL ISLAND WOOL	70,000 kg
EAST TOTAL WOOL	1,470,000 kg
TOTAL KILOMETRE TONNES TO STANLEY	139,991 kmt
TOTAL KILOMETRE TONNES TO NEWHAVEN	99,881 kmt
OPTIMUM KILOMETRE TONNES TO STY/NHV	74,046 kmt
OPTIMUM KILOMETRE TONNES USING PORT SAN CARLOS AND NORTH ARM	45,245 kmt

TABLE 9 - POSSIBLE WOOL MOVEMENTS - WEST FALKLAND

LOCATION	FARM	KILOS	km TO PORT			KILOMETRE TONNES			OPTIMUM KM TONNES
			TO PS	TO FBV	TO PH	TO PS	TO FBV	TO PH	
FOX BAY VILLAGE	PORT STEPHENS	28,500	NIL	70	145	NIL	1,995	4,133	NIL
	SOUTH HBR	21,000	15	55	130	315	1,155	2,730	315
	STONEY RIDGE	11,000	30	40	115	330	440	1,265	330
SPRING POINT	LEICESTER FALLS	17,500		40	115	-	700	2,012	700
	EAST BAY	14,500		25	100	-	362	1,450	362
	LAKE SULLIVAN RINCON RIDGE	18,000		5	75	-	90	1,350	90
PHILOMEL COAST RIDGE	LAKELANDS	18,500		15	60	-	278	1,110	278
	SHALLOW HBR	34,000		NIL	75	-	NIL	2,550	NIL
	DUNNOSE HEAD NARROWS	23,500		NIL	75	-	NIL	1,762	NIL
PORT HOWARD	CHARTRES LITTLE CHARTRES	12,500		70	95	-	875	1,188	875
		10,500		65	90	-	683	945	683
		13,000		65	90	-	845	1,170	845
PORT HOWARD	CHARTRES	57,500		50	55	-	2,875	3,162	2,588
	LITTLE	17,000		25	50	-	425	850	765
	CHARTRES								

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TEAL RIVER	16,000	45	50	25	-	720	800	400	400
SHEFFIELD	15,500	55	60	25	-	853	930	388	388
SADDLE	27,000	40	35	35	-	1,080	945	945	945
HARPS	21,000	55	20	-	-	1,155	420	-	420
BOLD COVE	16,000	75	5	-	-	1,200	80	-	80
MANYBRANCH	16,000	75	5	-	-	1,200	80	-	80
PORT HOWARD	157,000	75	NIL	-	-	11,775	NIL	-	NIL
HILL COVE									
MAIN POINT	21,000	95	95	25	-	1,995	1,995	525	525
SHALLOW BAY	17,000	90	90	20	-	1,530	1,530	340	340
WEST LAGOONS	18,000	70	70	NIL	-	1,260	1,260	NIL	NIL
WESTLEY	11,000	70	70	NIL	-	770	770	NIL	NIL
THE PEAKS	16,000	70	70	NIL	-	1,120	1,120	NIL	NIL
MOSSVALE	12,500	70	70	NIL	-	875	875	NIL	NIL
BOUNDARY	14,500	85	85	5	-	1,232	1,232	72	72
CROOKED INLET	12,500	85	85	20	-	1,062	1,062	250	250
PICKTHORNE	7,500	85	85	20	-	638	638	150	150
PORT NORTH	16,500	85	85	20	-	1,402	1,402	330	330
TOTALS						37,795	44,898	-	11,996

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OTHER PORTS

DUNBAR	DUNBAR	9,500	15km to HC/RC road
	HOPE HARBOUR	12,000	

		21,500	
ALBEMARLE	ALBEMARLE	20,500	15km to P Stephens road
PORT EDGAR	PORT EDGAR	23,000	15km to Fox Bay- Port Stephens road

ISLANDS

BEAVER	8,000	
WEDDELL	27,500	
NEW ISLAND	1,500	

		37,000
WEST POINT	6,500	
CARCASS	4,500	
SAUNDERS	36,000	
GOLDING	10,500	
PEBBLE	36,000	

		130,500

TABLE 10 - WEST FALKLAND WOOL - SUMMARY

TOTAL ROAD TRANSPORTABLE WOOL	762,000 kg
TOTAL MAINLAND NON-ROAD WOOL	65,000 kg
TOTAL ISLAND WOOL	130,500 kg
WEST TOTAL WOOL	957,500 kg
TOTAL KILOMETRE TONNES TO PORT HOWARD	44,898 kmt
TOTAL KILOMETRE TONNES TO FOX BAY VILLAGE	37,795 kmt
OPTIMUM KILOMETRE TONNES TO PH/FBV	23,642 kmt
OPTIMUM KILOMETRE TONNES USING HILL COVE AND PORT STEPHENS	12,187 kmt

5.5.1 East Falkland Wool

It is interesting to note the effect the road system has already had on the collection of wool on East Falkland. Excluding the Islands, the 95/96 woolclip on the East was delivered to Stanley by road from all farms except North Arm, Walker Creek, Port San Carlos settlement farms (Race Point, Smylies, Moss Side), San Carlos settlement farms (Blue Beach, Kingsford Valley), Wreck Point, Salvador and Johnsons Harbour.

The Port San Carlos farms are likely to use road transport next season and Salvador and Johnsons are pushing hard for link roads and might switch to road. San Carlos would likely switch once there was a road (all of this assuming the collection point remains Stanley).

There appears to be an emerging "going rate" for overland wool transport, at around 20 pence per tonne per kilometre (kmt). This represents a delivered charge of around £28,000 for all the East Falkland mainland wool to Stanley. Were it delivered to Newhaven the cost would be around £20,000, and were it delivered to Stanley or Newhaven (to the closest of the two ports) the cost might be around £15,000.

These prices (which do not include the additional £2.50 per bale handling charge at FIPASS which is included in the sea freight rate) compare favourably to sea transport. For example the Goose Green wool clip could be delivered by road to Stanley for £5,700 haulage plus £2,137 handling charge at FIPASS, a total of £7,837, or for £12,064 by sea.

Applying the known Goose Green kmt price to for example North Arm (250T to be carried 150 km) the delivery cost would be £7,500 haulage plus £1,875 handling charge (total £9,375) compared to £10,582 by sea (250T at 'A' port rates of £42.33 per tonne).

For Salvador the comparison becomes £1,017 haulage, plus £565 giving a total of £1,582 compared to £3,215 by sea ('C' port rate @ £56.91 per tonne).

It should be noted that the sea freight rate represents recovery of only around 50% of actual cost. For a true comparison sea freight rates should be doubled.

This comparison is not to indicate a preference for one form of transport over the other (and indeed roads transport rates could vary substantially between operators and locations) but it does illustrate the point that provided roads are built to all key areas, the financial incentive to farms to use road transportation even over long distances is clearly there.

Clearly the optimum solution from purely a road transportation point of view is to centralise at the closest port; this is shown in the analysis for illustrative purposes, (Port San Carlos, Stanley, Newhaven and North Arm) but would not work in practice on the East since the motivation to the farmer is to get wool to the point of export for the least cost.

Taking the example of Port San Carlos, whilst in theory it would be cost effective to centralise wool at Port San Carlos from all the Port San Carlos farms and New House, since Port San Carlos is not the point of export there is still a shipping charge to Stanley which exceeds the road transportation cost.

The analysis is only strictly relevant therefore where the port of collection is the point of export. Whether in the final analysis it would be cheaper for farmers to centralise at Newhaven, or Stanley and Newhaven, would depend on the relative costs of shipping from Stanley and Newhaven - if indeed there is ever a deep water port at Newhaven!

5.5.2 West Falkland Wool

The situation on the West (as regards the use of roads for wool movement) is to date wholly different to the East, since there is little incentive to move wool to other ports (there is at present no point of export on the West and therefore all wool must be shipped to Stanley). The differential in shipping wool to Stanley between for example Chartres and Port Howard is £7.41 per tonne. Using the road transport price from the East of 20p per kmt the cost of moving Chartres wool to Port Howard would be £632 or £11.00 per tonne - clearly more expensive at current differentials than shipping direct to Stanley from Chartres.

If however Port Howard were the point of export (from a newly constructed deep water jetty) the saving to Chartres would be of the order of £38.75 per tonne - a significantly different proposition.

As a further example the cost of moving Port Stephens wool to Port Howard by road might be of the order of £827 or £29.00 per tonne. Whilst significantly higher than Chartres it is still 30% cheaper than the cost of shipping to Stanley; the financial viability for Port Stephens would turn on the difference (if any) in shipping charges from Port Howard compared to Stanley.

A further interesting comparison might be between shipping from Spring Point, one of the small single user ports, and Fox Bay, the nearest key port. Moving Spring Point wool to Fox Bay would cost of the order of £140 (17.5 tonnes over 40 km at 20p per kmt); shipping from Fox Bay to Stanley would be £740 (17.5 tonnes at £42.33 per tonne) giving a total transport cost assuming no "port" costs at Fox Bay of £880. The cost of shipping directly from Spring Point is £995 (17.5 tonnes at £56.91 per tonne). At these differentials the premium to ship from the home port (£115 for his year's wool clip) must be worth paying for the convenience. If however Port Howard became the point of export, Spring Point could truck to Port Howard for £402, a saving on the year's wool clip of £593, or 3.4 pence per kilo (again assuming port and shipping charges from Port Howard were similar to Stanley).

5.6 Conclusions on Wool and Freight on Roads

The natural conclusion from the above is that there is already a clear financial incentive for farmers on the East to make full use of the roads for transportation of wool, and inevitably for general freight. For farmers on the West there is only an incentive to move wool (a) directly to a point of export (Fox Bay or Port Howard) if there were a deep water jetty used by northbound shipping; or (b) to a better port if the differentials charged between good quality multi-user 'A' ports and 'B' or single user 'C' ports were greater, and represented something nearer the cost difference for the two types of operation.

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A major benefit of collecting all wool to a small number of key ports is that the whole coastal shipping operation becomes more efficient - the same volume of freight from less ports and the same revenue for substantially less steaming time. This would then free up time in the vessel itinerary for other activities - more trips to Punta Arenas for profit generating cargoes, or more cross the Sound activities for general trade, stimulation of stock trading activities, providing animals to the abattoir and providing supplies to MOD bases on the West.

5.7 Roads and Link Roads - Future Programme

Presented herewith are scenarios for the completion of spine roads and the provision of link roads to all existing farm settlements.

- 5.7.1 Subject to the comments made in Section 5.2.2 the possible timetables for completion of spine roads on the East are as shown in Tables 11 and 11A. Table 11 shows a sequence in which the road from Darwin goes first to Newhaven and thereafter to North Arm. This represents a departure from the existing policy of linking key population centres first (except that it may be argued that linking the East and West with a fast cost-effective shipping service is the most productive linkage), but puts the transport policy firmly behind the rural development policy of encouraging the production of sheep and beef for meat (for the new abattoir) and the encouragement of trade in livestock.

Table 11B shows continuance of the road first to North Arm, making it four seasons before there could be a terminal at Newhaven, though Port San Carlos would be available in the meantime. It should be noted that the PSC-Stanley road may not be suitable for haulage of cattle by truck.

Both Tables show the construction of Burntside-Gibraltar Gate, completing the road through San Carlos and giving the North Camp better access to Newhaven/Saladero, before the road to Walker Creek. It may for practical purposes be preferable to complete the Lafonia works after North Arm/Newhaven before moving north.

It should just be mentioned in this context that no allowance is made in this programme for any other Lafonia works which may become necessary as a result of future development of FLH.

These timetables are also based on the assumption that roads would be built to current standards (5T axle loads) using the level of resources currently available in road construction teams (ie similar to White Rock or the PWD North Camp team).

Table 11 - East Spine Roads - Timetable I

	96	97	98	99	00	01	02	03	04
Darwin-Cobbs Pass (10 km)	-----								
Rams Gate- Newhaven (15 km)		-----							
Cobbs Pass-North Arm (40 km)			-----						
Burntside-San Carlos (25 km)					-----				
San Carlos- Gibraltar Gate (20 km)						-----			
Colorado Pass- Walker Creek (25 km)							-----		

Table 11A - East Spine Roads - Timetable II

	96	97	98	99	00	01	02	03	04
Darwin-Cobbs Pass (10 km)	-----								
Cobbs Pass-North Arm (40 km)		-----							
Rams Gate- Newhaven (15 km)				-----					
Burntside-San Carlos (25 km)					-----				
San Carlos- Gibraltar Gate (20 km)						-----			
Colorado Pass- Walker Creek (25 km)								-----	

Thus a further eight construction seasons should see the completion of the spinal network of roads on the East (at least in their initial phase). Any further works after 2004 would be determined by developments to that time in terms of both road and land usage.

5.7.2 East Link Roads

We noted in Section 3.1.2 those link roads on the East which remained to be completed. The prioritisation of these is rather more difficult than the main roads which have a simple logic in terms of numbers and progression (see also Section 5.2.4).

On the basis of "greatest benefit to the most number of people" in suggesting priorities for East Link Roads we take as the highest priority those sites which have no infrastructural alternative (sea for freight, airstrip for passengers), and where the existing tracks are very poor.

On this basis the clearest priorities are

Group A

1. Cape Dolphin via Elephant Beach (15 km)

A total of 40-50,000 kg of wool to be hauled over poor ground to the road near New House. The link road works already completed are inadequate to create all weather tracks. There is no port option and no airstrip (the closest being Douglas at 25 km). The road would serve two single family farms (presently 7 residents) and provide tourism opportunities for Cape Dolphin.

2. Greenfield (10 km)

In the same general vicinity as Cape Dolphin/Elephant Beach, carts 25-30,000 kg of wool to the road near Gibraltar Gate (across the San Carlos river), over some poor ground and difficult ditches. Nearest port/airport at San Carlos (about 10 km) over the equally difficult Verde Mountains. The link road would ultimately form the final stretch of the Burntside-Port San Carlos spine road and should therefore be built to (or be capable of being upgraded to 5 tonne axle load). No bridge over the San Carlos recommended, but a pass (as at Little Chartres).

3. Bombilla (10 km)

Isolated single family farm in Bombilla flats approx 10 km from the road at Hope Cottage (or a little further going east to Chata area). No port option, airstrip at Douglas. Hauls 8-10,000 kg of wool to Hope Cottage, over some poor ground (in particular two soft flats). May not require continuous track.

Group B

1. Johnsons Harbour (10 km)

Produces 50-55,000 kg of wool shipped by sea-truck from a good jetty. Some linkworks already carried out but more extensive works required on the high-tide track. Airstrip redundant since the road reached Port Louis. Lot of hard ground where grading and a wearing course would provide a good road. On the route to Volunteer Point, therefore heavily used.

Further 15 km to Volunteer Beach over poor ground. Heavily used and a key element of the tourism industry. The farm would strongly support a proper road to Volunteer, from which the tourism industry would clearly benefit substantially.

2. Rincon Grande via Horseshoe Bay (15 km)

A total of 50-60,000 kg of wool is hauled over mainly hard ground to the Port Louis road. Like Johnsons a good wearing course over graded ground and some repairs to culverts would provide a good inexpensive all weather road.

3. Salvador (30 km)

The track to Salvador is tide dependent and in many places not suitable for link works. There are currently 6 residents; the farm produces 55-60,000 kg of wool which is shipped from a good jetty by sea truck, and there is a good airstrip. The road would provide additional tourism opportunities for Salvador. Similar vicinity to the Group A farms and could therefore be done from the same base.

Group C

1. Murrell (8 km)

Haul 8-10,000 kg of wool to Stanley over very poor ground even in summer. Also very tide-dependent. No other options though small boat to Stanley would be feasible. Single family farm (6 residents), some limited tourism and Stanley recreational possibilities. First stretch of the track to the Murrell River heavily used by Stanley residents.

2. Long Island (5 km)

Single family farm hauling 12-15,000 kg of wool to the road past Green Patch. No port or flight options. Relatively restricted link works required.

3. Brookfield (2 km)

Two family farm (5 residents) haul 11-13,000 kg of wool to road near Green Patch. Hard ground, grade and wearing course would provide durable inexpensive option.

4. Moss Side (2 km)

Just off main road into Port San Carlos. Single family farm "missed" by the road. Haul 24,000 kg of wool to PSC road and on to Stanley. Relatively minor link works. Though Group C, could be done for convenience with Cape Dolphin/Greenfield - possibly at the same time if sufficient plant.

5. Riverside (3 km)

Part-time farm off Fitzroy Road, hauls 4,000 kg of wool. Works possibly not justifiable in present circumstances.

6. Wreck Point (5 km)

Single family farm off San Carlos road producing 15,000 kg of wool. Currently shipped out by sea-truck from Ajax Bay. Owner has carried out work on the track time permitting. Could be assisted to completion by San Carlos road contractor or main road team when in the vicinity.

In the above groupings and on the basis that the works are to be carried out by the existing PWD North Camp gang the East link road programme might be as Table 12, but with the options noted below.

5.7.2.1 Options on Link Roads

There are as always some options in the suggested programme

- (a) Bring forward Salvador to the first position in Group B since it is in the same geographical region as the Group A farms.
- (b) Delete Volunteer, though it should be noted that this is the only road from which there is a clear economic benefit. Possibly a "toll sharing" arrangement could be negotiated with the landowner.
- (c) Bring forward the Long Island and Brookfield jobs to be done by the flying squad or at the end of the season.

5.7.2.2 Link Roads - Leisure and Diversification Use

The system of priorities which was agreed by Executive Council in 1994 was based only on considerations of supporting the existing sheep farming industry. However the use of camp tracks for leisure purposes has created an additional demand for link roads, to support farms wishing to diversify or earn additional income, particularly from tourism. Whilst this has been highlighted in the recent controversy over access to Volunteer Point, it has been an issue for some time. Blue Beach Lodge has been vocal for some years in its request for improved access through Bodie Peak Valleys and over Sussex Mountain to enable tourists to access the lodge and Ajax Bay.

A significant proportion of the argument for a link road to Cape Dolphin is to enable them to benefit from tourist access. At least four other farms in the San Carlos/Port San Carlos area benefit from tourism/leisure use of their facilities. Salvador may argue that good road access would lead to far greater use of their facilities.

Taken from a different perspective, the Murrell farm may argue that use of its track by Stanley residents (for fishing, picnicing or simply driving) creates substantial damage to the track, and subsequent access problems for them.

It may no longer be sufficient to set priorities simply based on supporting the status quo. Additional economic benefit (additional earnings and cost reduction) to the area served should be given a measure of consideration.

Two alternative scenarios for construction of East link roads are offered for consideration in Tables 12 and 12A.

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Table 12 - East Link Roads - Timetable I

	96	97	98	99	00	01	02	03	04
Cape Dolphin & Elephant Beach	-----								
Moss Side		---							
Greenfield		-----							
Bombilla			-----						
Salvador				-----					
Johnsons Harbour					-----				
Volunteer						-----			
Rincon Grande & Horseshoe							---		
Murrell								-----	
Long Island									---
Brookfield									---

Table 12A - East Link Roads - Timetable II

	96	97	98	99	00	01	02	03	04
Cape Dolphin & Elephant Beach	-----								
Moss Side		---							
Greenfield		-----							
Bombilla			-----						
Murrell				-----					
Johnsons Harbour					-----				
Volunteer						-----			
Salvador							-----		
Rincon Grande & Horseshoe								---	
Long Island									---
Brookfield									---

5.7.3 West Spine Roads

There would appear to be two differing options for the completion of the spine roads and link roads on the West:

Option A. Use the existing contractor (or its successor) to build to Hill Cove/Roy Cove, then switch to Fox Bay-Port Stephens followed by Little Chartres-Shallow Harbour. The now redundant flying squad plant on the East be moved to the West with some enhancement to create a resource capable of following the main contractor to carry out all the link road works; alternatively

Option B. Appoint a second fully resourced team on the West to build from Fox Bay to Port Stephens, and do the link roads in the south area, whilst the existing contractor continues in the north to complete Hill Cove/Roy Cove and all the northern area link roads, and also Little Chartres-Shallow Harbour.

Table 13 sets out the schedule for West spine roads suggested above.

Table 13 - West Spine Roads - Timetable - Option A

	96	97	98	99	00	01	02	03	04	05
Hill Cove t/o- Hill Cove/Roy Cove (40 km) -----										
Fox Bay - Port Stephens (70 km) -----										
Little Chartres- Shallow Harbour (45 km) ----->										mid 06

Section 5.7.4 describes the West link roads programme based on this option.

On this schedule (which is perhaps a little tight depending on conditions) and assuming there is no change to the specification which will slow down the works the West main road programme would be completed within a further 10 construction seasons.

It should be noted that Little Chartres - Shallow Harbour has been added to the list of main roads for the first time. It would in fact serve 3 farms with a present population of 12, in an area that produces 36,000 kg of wool. The port facilities are very poor, and the needs of the area are perhaps greater than several others on East and West who are to be served with roads. Were it not maintained in the main road section the area should most certainly be first priority for link roads.

It should also be noted that should there be a decision to build a deep water jetty at Port Howard a stretch of road will be required from Port Howard settlement to the jetty site (approx 5 km), plus resources to construct the jetty itself. If the spine road programme is not to be disrupted additional resources would be required for this contract.

5.7.4 West Link Roads

We have noted in Section 3.1.4 the link roads which remain to be completed. The following prioritisation is proposed on the basis of the existing policy (Section 5.7.2) and Option A above; the actual programme is more difficult because of fewer resources on the West.

the East some of the links which may be of higher priority cannot yet be accessed by heavy machinery.

On the basis of Option A in Section 5.7.3 and priority restricted by practicality the suggested list of priorities is:

1. Shallow Bay/Main Point (22 km)

Two single family farms (6 residents) hauling 38-40,000 kg of wool to Hill Cove; there are no port or airstrip options at either farm. Track from Hill Cove a combination of good going, hard rough ground, a few ditches which need culverting and a crossing of the Sound River. Would greatly benefit from link works followed by some grading and wearing course (after the main road reaches Hill Cove and the grader is available).

2. Sheffield Farm (7 km)

Single family farm, currently non-resident in the winter time. Produces 15-18,000 kg of wool taken from the beach by sea-truck; an exposed and potentially hazardous operation. Poor ground conditions to Hill Cove road; ditch and stream crossings particularly required; non-continuous link works adequate for short term only, would require up-grading by main road team at some point.

3. Port North/Dunbar/Hope Harbour (18 km)

Two farms operated as a single unit at Dunbar/Hope Harbour, 3 residents, producing 22-24,000 kg of wool which is shipped by sea-truck; there is a good harbour but presently no jetty though one is under construction. Port North hauls 16,000 kg of wool about 5 km to Roy Cove for shipment. Ground conditions good to Port North where grade and wearing course would provide a good surface. Beyond Port North to Dunbar would require further inspection and advice.

4. Westley (3-5 km)

Single family farm, currently shears in Hill Cove but will move to Westley. 10-11,000 kg of wool, no port or airstrip. Relatively good ground to link to Hill Cove road.

5. Philomel Farm (5-7 km)

Single family farm resident in Fox Bay Village, hauls 18-20,000 kg to Fox Bay. Link options south to FBE/FBW road or east to Chartres-Fox Bay road. Normally low priority but geographically would fit at this stage.

6. East Bay (17 km south or 10 km north)

Options south to Fox Bay (in which case priority 5) or north-east to Little Chartres-Shallow Harbour road, in which case it would have to be delayed until half way through the first season of the Little Chartres-Shallow Harbour road. Isolated single family farm hauling 14-16,000 kg of wool to Fox Bay; no port or airstrip options.

Ground conditions not well known for either option, but almost certainly extensive works required.

7. Spring Point (12 km)

Single family farm (2 residents) produces 17-19,000 kg of wool shipped by sea-truck from own jetty facility; can be very exposed. Good airstrip. Track route generally good ground, but would benefit from intermittent link works to the main road, enabling shipment from Fox Bay or Port Howard.

8. Port Edgar (15 km)

Isolated single family farm with 5 resident producing 23-24,000 kg of wool shipped by sea-truck from sheltered port; newly licensed airstrip. Link works could not commence until the main road had passed Lake Hammond. Some deep soft valleys interspersed with harder good going on ridges. Poor conditions around Mt Emery.

9. South Harbour (5 km)

Single family farm hauling 21-25,000 kg of wool to Port Stephens; no port or airstrip options other than Port Stephens (approx 15 km by link/main road). Would probably require continuous track over mainly difficult ground.

10. Albemarle (20 km)

Single family farm with 4 residents, probably the most isolated mainland farm in the Falklands. Route for link works unresearched, could not start until main road virtually to Port Stephens. Produces 20-24,000 kg of wool shipped by sea-truck from sheltered harbour. Airstrip under preparation but not likely to be ready for 2-3 years (nearest airstrip 25 km to Port Stephens - in emergency would have to rely on military helicopter).

Close to MOD base on Mount Alice; link road would probably be used by military for re-supply - they plan to build a road up Alice from Albemarle some of which would serve as the link towards the main road.

On the above recommendations the schedule would be as Table 14.

5.7.4.1 Options to Table 14

Because of the restrictions placed on the link roads programme by the speed of the main roads there are restricted options, however

- (a) Instead of considering Albemarle, South Harbour and Port Edgar in the programme for link works, undertake substantial advance works to Shallow Harbour using the enhanced flying squad, and leave the main construction team in the south to do Albemarle, South Harbour and Port Edgar; then move it to Shallow Harbour for completion/upgrading.
- (b) Do the Fox Bay area links first (East Bay, Spring Point, Philomel) before moving to the northern area.

Table 14 - West Link Roads - Option A

	96	97	98	99	00	01	02	03	04
Hill Cove - Shallow Bay/Main Point	-----								
Sheffield		---							
Port North/Dunbar/ Hope Harbour			-----						
Philomel				---					
East Bay					-----				
Spring Point						---			
Port Edgar							-----		
South Harbour								---	
Albemarle									-----

5.7.4.2 Link Road Resources

The above programme is based on there being enhanced resources in the West for link roads. At present the flying squad is equipped with a JCB, two light dumper trucks, a Country tractor and tipping trailer; this is insufficient to enable the works to progress at the rate shown.

If link roads on the East are to be carried out by the PWD North Camp team, the East flying squad will become redundant. It is recommended that it be relocated to the West and then further supplemented with a D6 and two Volvo trucks; further human resources will be required, a gang of perhaps 6-8 persons will be required. Every effort should be made to involve farm labour in the link works, possibly on a paid basis to enhance the labour force wherever possible.

5.8 West Spine and Link Roads - Option B

As noted in Section 5.7.3 an alternative to the programmes and priorities described in Section 5.7.4 would be to further enhance the resources on West Falkland to establish two full teams, one to complete spine roads and all link roads in the north, and the other to complete all spine roads and link roads in the south.

Clearly the resources required for this option would require supplementation beyond that envisaged for the enhanced flying squad - a likely additional capital requirement of around £1million (but possibly less if awarded to an independent contractor). There would be little or no reduction in total construction time to complete the current programme but benefits would begin to accrue to Fox Bay West and Port Stephens farms two years earlier.

Tables 15 and 15A show the revised north and south programmes respectively.

Table 15 - Timetable Option B - North West

	96	97	98	99	00	01	02	03	04
Hill Cove t/o- Hill Cove (25 km)	-----								
Roy Cove t/o- Roy Cove (15 km)			-----						
Shallow Bay/ Main Point				-----					
Port North/Dunbar/ Hope Harbour					-----				
Westley						----			
Sheffield							----		
Shallow Harbour (45 km)								-----	

Table 15A - Timetable Option B - South West

	96	97	98	99	00	01	02	03	04	05
Fox Bay - Port Stephens	-----									
South Harbour					----					
Albemarle						-----				
Port Edgar							-----			
Spring Point								----		
East Bay									-----	
Philomel										----

5.9 The Military Dimension

As well as the site on Mt Alice referred to above, the MOD have a major site on Byron Heights not far from Dunbar and a well used R&R centre at Shag Cove (Port Howard). They have expressed keen interest in the Sound crossing which would enable them to supply their refuelling sites at Fox Bay and Hill Cove, and to be able to then re-supply Byron and Alice from there by helicopter or road. They are seriously considering a central supply depot at Port Howard making regular use of a ferry crossing (at least weekly) operated by the St Brandon, to which there would be civilian access.

The MOD have built a road from Long Creek to Byron Heights (for access from Byron to the fuel pumping station). It is not evident how this would assist our network, though undoubtedly if they could get by road from Hill Cove to Dunbar they might be prepared to fund the road on to Long Creek giving them full road access to Byron and giving Dunbar road access most of the way to the albatross colony at Grave Cove.

As the Mt Alice road is still in planning (though it could be built next year) there should be scope to consider co-operation on the route to the benefit of Albemarle.

The military effect on the Sound crossing is considered in more detail below.

5.10 Overall Road Programme

Tables 16, 17, 18 and 19 show four options for a continuing overall programme. They are based on:

Option I - Newhaven before North Arm on the East, one contractor and an enhanced team for link roads on the West

Option II - North Arm before Newhaven on the East, two contractors working north and south on the West

Option III - Newhaven before North Arm on the East and two contractors on the West

Option IV - North Arm before Newhaven and one contractor and enhanced link road team on the West.

All options assume the PWD team remain in the North Camp on the East and complete link roads, with a second contracted team undertaking the Lafonia and PSC roads.

Table 16 - Roads - Overall Programme I

	96	97	98	99	00	01	02	03	04	05	06
East Roads											
Newhaven	..	-----									
North Arm			-----								
San Carlos					-----						
SC-PSC						-----					
Walker Creek								-----			
East Link Roads	..	-----									
West Roads											
Hill Cove	..	-----									
Roy Cove			-----								
Port Stephens						-----					
Shallow Harbour								-----			
West Link Roads			-----								
Abattoir completed										..*	

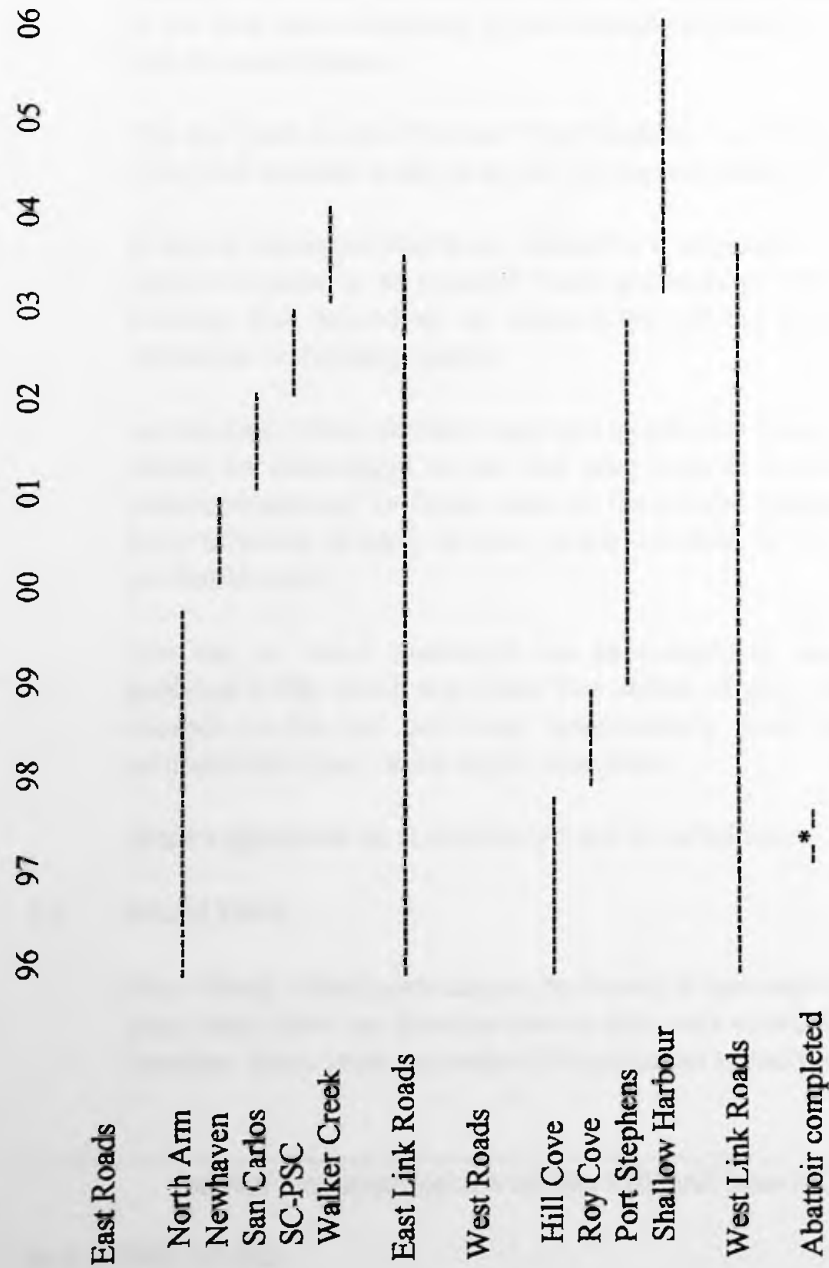
Table 17 - Roads - Overall Programme II

	96	97	98	99	00	01	02	03	04	05	06
East Roads											
North Arm	-----									
Newhaven					-----						
San Carlos						-----					
SC-PSC							-----				
Walker Creek								-----			
East Link Roads	-----									
West Roads											
Hill Cove	-----									
Roy Cove											
Port Stephens											
Shallow Harbour											
West Link Roads	-----									
Abattoir completed											

Table 18 - Roads - Overall Programme III

	96	97	98	99	00	01	02	03	04	05	06
East Roads											
Newhaven	-----										
North Arm			-----								
San Carlos				-----							
SC-PSC					-----						
Walker Creek						-----					
East Link Roads											
West Roads											
Hill Cove	-----										
Roy Cove			-----								
Port Stephens				-----							
Shallow Harbour					-----						
West Link Roads											
Abattoir completed			---*								

Table 19 - Roads - Overall Programme IV



6. INTER ISLAND SHIPPING - FUTURE PROGRAMME

6.1 The Key Port Concept

The overall strategy for making the transportation of freight and livestock around the Islands more cost effective is to link key ports with a system of spine and link roads, such that each geographical area has free access to a "key" port. At each key port there would be required a jetty in good repair which could be used by the Tamar (or her successors) at all, or most, states of the tide, and warehouse facilities for the collection of wool and the distribution of freight.

The key ports on the East are North Arm, Newhaven (not yet in existence) and Stanley, with Port San Carlos retained in a reserved status for major shipments to the area and emergency (if for example a stretch of road or crossing were lost for some reason).

The key ports on the West are Port Stephens, Fox Bay and Port Howard, with Hill Cove retained in the same sort of reserved status as Port San Carlos.

It is also envisaged that there should be a shipping link across the Sound on either a regular or as required basis, normally between Newhaven and Port Howard, but depending on demand any of the other key ports could be collection or discharge points.

As the road system develops and gives each area access to a key port, so they should be encouraged to use that port; thus as freight movements become more concentrated in fewer areas so the coastal shipping operation becomes more efficient, freeing up time in the schedule for sound crossings or other profitable work.

The way in which customers are encouraged to use the key ports is by applying tariffs which still allow free choice of port, but which are markedly cheaper in the key ports and progressively more expensive for poor or restricted facilities, or for single user ports.

Some suggestions on revised tariffs are included below.

6.2 Island Ports

Very clearly island ports cannot be treated in the same way as mainland areas since they have no direct access to the road network. It is recommended therefore that a study be made of the principal island ports to establish:

- (a) whether their facilities are adequate for likely future demand (eg collection of sheep or cattle by Tamar);
- (b) how the facilities can best be upgraded - through relocation, enhanced maintenance, new works or purpose built trailer type jetties.

For the purpose of this study the principal island ports should be taken as those which currently produce 20,000 kg of wool per annum, or who can demonstrate a new or ongoing economic activity of significant proportions that will require an enhanced facility. Those who currently produce over 20,000 kg are Lively, Speedwell, Weddell, Saunders and Pebble (no other island farm in fact produces more than 10,000 kg).

6.3 East Falkland

It is clear from the earlier analysis of trends in wool movement and the projected schedule for road building that at current tariff rates wool collections from East Falkland farms will continue to fall. It is conceivable that within the next five years the only collections from the East will be the islands of Lively, Bleaker, George/Barren and Speedwell, and Walker Creek.

This reference to current tariffs is not to suggest that there should be a wholesale revision of the tariffs to recapture the business; that in terms of the Islands as a whole is likely to be counter-productive and make something of a nonsense of the investment in roads. From the coastal service operators point of view however it might be sensible to target one or two key areas (eg North Arm, Walker Creek) and ensure that the tariff for these remains competitive with road transportation.

Although throughout this report the emphasis has been on wool collections rather than freight distribution the two tend to go hand-in-hand. As a farm begins to send its wool overland, so it receives the bulk of its freight overland.

6.4 West Falkland

As well as the East islands there are the more numerous West islands which will continue to require a shipping service, most particularly Weddell, Saunders and Pebble which are major wool producers. In addition there are the mainland areas previously noted at Albemarle and Port Edgar and possibly Dunbar which, if they get link roads, may not be for some while.

The business available to the coastal shipping service for the balance of the mainland West Falklands depends to some extent on the construction (or not) of a deep water port at Port Howard or Fox Bay for the collection of wool. If the deep water jetty is built, and wool can be taken directly northbound, it is

shown in Section 5 that it is likely that all West Falkland mainland wool (with those possible exceptions noted above) would move that way.

The Falkland Islands Company however do not believe that incoming freight would, to any great extent, be consigned directly to the West. They contend that this was the case in the days of the AES, and various practicalities make it unlikely that incoming general freight would be delivered direct. There remains a role for the coastal shipper therefore to distribute general freight to the West, either on the existing pattern or via a ferry service across the Sound.

If a deep water jetty is not built then clearly wool must continue to be moved to Stanley; the most efficient way to do this would be by shipping to and from the key ports (Port Howard, Fox Bay, Port Stephens and possibly Hill Cove), and distribution to the rest of the West being by road. The tariff structure for the service should be re-cast to make this attractive to users, whilst allowing continued use of single user or poorer ports, but at higher cost.

Since any decision to build a deep water jetty would not result in the facility being in place for at least two years (given survey, design and construction time), but since the road system is already well advanced it is recommended that the tariff structure be recast immediately to effect the key port philosophy, creating greater operating efficiencies for the coastal shipping service and enabling more time in the itinerary for more trips to Punta Arenas (or elsewhere) and more time for Sound crossings.

6.5 Tariff Structures

- 6.5.1 The existing tariff structures are largely based around port water depth as a reflection of the working efficiency of ports; this has been an adequate system up to now, and despite the degree of arbitrariness inherent in it (because of the diversity of other qualities of ports), most customers have accepted it as providing some degree of equity and fairness as between outlying ports.

The structure is workable so long as all farms or settlements rely on the same transportation system; the advent of roads (at considerable public cost) now gives many East farms particularly a much cheaper road alternative to Stanley, and upsets the equilibrium. It is the concept of equity and fairness in treatment of all citizens, together with the opportunity through roads to create a more efficient shipping system, that makes a radical re-think of the tariff now opportune and appropriate.

Similarly island farms foresee all mainland farms getting the opportunity of cheaper shipping tariffs through roads and key ports, to which they will not have access.

What in these circumstances is fair and equitable for the longer term? The options available would appear to be:

- (a) apply a tariff system which most equates to the cost of providing the service, which would include tariff elements which consider difficulty of operating the port, distance from origin/destination, and volume of cargo (this is contrary to recent policy which has been aimed at greater simplification and uniformity of tariff);
- (b) operate a purely volume based tariff, under which the larger multi-user ports would be cheaper than single user ports. This encourages greater centralisation of freight and therefore greater operational efficiency, but discriminates against those who cannot access multi-user ports (eg islands and remote mainland areas);
- (c) retain the existing port quality criteria as the determinant of tariff, but increase the spread of rates to more accurately reflect relative ease of use (and cost). This would encourage greater use of better ports, but would discriminate against those with no access to better facilities;
- (d) adopt a single tariff for all ports. This maximises equity, but does nothing to encourage multiple use and improved efficiency;
- (e) adopt a single tariff for all key ports and other ports which cannot access the road network, and substantially higher tariffs for non-key ports. This would encourage multi-use without adversely affecting those who do not have access to the road network. As they gained access so their port would attract the higher charge;
- (f) make all freight movements free of charge and substitute the freight subsidy for other farm subsidies (since costs are reduced). This would be simple to administer, but would not encourage efficient use of the service either by customers or the providers.

6.5.2 The next question becomes how to set the level of tariff; at present tariffs collect around 50% of the cost of provision of the service, with the balance paid in subsidy to the provider of the service. The first question to be addressed then is the level of affordability, irrespective of the method of charging (other than in (f) above).

It is suggested that the solution which combines equity with efficiency to the greatest extent is option (e) above. In this case the way to set the single tariff might be to try to equate it to the cost of movement by road; it will be recalled that the road transport price for wool on the East has been shown to be around 20 pence/tonne/kilometre. By applying this to either Fox Bay or Port Howard (as nominal collection centres) and using 20p per kmt, each being very

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roughly 200 kilometres by sea from Stanley, the price for one tonne would be £40. This compares to the existing 'A' port rate of £42.33.

This rate of £40 per tonne for wool would then apply to all key ports and others with no access to the road system. The general freight rate might be taken as a percentage of this (say 80% as the current wool/freight differential).

Other ports would attract a tariff surcharge of 50% unless there were special circumstances.

- 6.5.3 This is not offered as a fully considered scheme, but indicates what might be done. It is recommended that subject to the acceptance of other key elements of this paper that Byron Marine and others consider and propose a tariff structure along these lines.

6.6 Punta Arenas Visits

Whilst external shipping is not strictly within the terms of reference of this report it cannot be divorced from the internal transport system (at least at this stage).

When the specifications were drawn up for the vessel to operate the coastal service (which resulted in the purchase of the Tamar), three elements of service capability were required

- (a) primarily the ability to carry out the traditional coastal shipping service to known patterns and volumes;
- (b) the ability to adapt to regular Sound crossings if in the light of developments that became economical;
- (c) the capability to undertake regular Punta Arenas runs, to bring back under Falklands control the regularity and reliability of these alternative and complementary supply opportunities.

The minimum size of the vessel was determined by this requirement, as was the unacceptability of a bow door (which might have been preferable for ferry and stock work).

In the event the reliability of the service has led to a steady increase in usage from just over 100 cubic metres of general freight per voyage in 1993, to just under 200 cubic metres per voyage during 1996. These cargoes have been supplemented by purchases of bulk fuel for Stanley Services up until mid-1995, and since then by substantial quantities of asphalt for the Stanley/MPA roads programmes.

Given that these roads programmes are to continue (supplemented by the East Stanley development) and that the asphalt supplies from Chile are price-competitive, it can be expected that there would be a continuing demand for the Punta Arenas trip to be run by Byron Marine (or their successors). Indeed it is the view of Byron Marine that they could increase the number of profitable runs to Punta Arenas were there time in the itinerary.

Were the Tamar not to continue these runs, or a vessel acquired to replace her which was not capable of providing this service, it is to be expected that regularity and reliability would be lost; this is clearly a matter for consideration in the future discussions on retention or replacement of the Tamar.

6.7 Sound Crossings

Sound crossings to date have been occasional and for social purposes only - Sports Week, Christmas, Farmer's Week, etc. As the road patterns develop and more people have better and better access to the ferry ports it is likely that this demand will grow, principally for transportation of vehicles and passengers, and were it a regular and reliable service, also for the distribution of general freight. It is unlikely that wool shipments would ever move between ports on the Sound; the other options will be commercially more attractive.

At the present time the ad hoc crossings between Port San Carlos and Port Howard take about 2.5-3 hours, with 2.5-3 hours driving time to/from Stanley. This is an adequate service for the present time, but is unlikely to be suitable for more regular crossings since

- (a) Port San Carlos is not sufficiently central to the East Falklands;
- (b) The jetty is in good condition and suitable for its current purpose, but was not built with regular crossings in mind and is not sufficiently flexible for vehicle and stock transport;
- (c) Port San Carlos is too far north to enable alternative calls to be made economically to Fox Bay;
- (d) Port San Carlos is not workable in strong westerly winds and may frequently be subject to delay.

The preferred alternative site for Sound crossings on the East, which was identified some time ago by a local sub-group tasked to select the best East Falkland Sound port, is Newhaven. The arguments in favour of Newhaven (and not San Carlos, Sussex or Egg Harbour) are not reiterated here but are readily available from the TAC. Sailing time from Newhaven to Port Howard

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is under 2 hours and to Fox Bay around 6 hours. It is a good all weather port with deep water, and could be worked from Goose Green (30 minutes drive were there a road).

This is the model for development of internal transport that has been favoured by all recent transport studies (Halcrow, PKF, Pryn Report, Action Plan), and by the Transport Committee.

There are now new additional reasons to reconsider Newhaven as the East Sound port

- (a) if there were to be a deep water jetty at Port Howard taking wool northbound it might be more economical for all wool to be collected from the Sound. It would certainly be more cost effective for most East farms to truck to Newhaven than Stanley;
- (b) the construction of the new abattoir prefaces the movement of more stock (sheep and cattle) from West to East for slaughter. The road from Newhaven to Stanley would be better able to accommodate heavy traffic than the existing Port San Carlos road which has some gradients and stretches which may be unsuitable to the transportation of cattle and sheep;
- (c) the establishment of the National Stud Flock at Saladero just a few kilometres from Newhaven. Whilst perhaps in itself not an overwhelming argument in favour of Newhaven, many West farmers would be able to collect stock easily from Saladero in their own vehicles whilst the vessel waited at Newhaven for 2-3 hours;
- (d) the emergence of greater trade in livestock, particularly sheep for the establishment of more specialist flocks, but also cattle for on-growing for sale to the abattoir, would require a central location on the East for collection and distribution;
- (e) the MOD are considering seriously the automation of the mountain-top sites at Byron and Alice, requiring substantially reduced manpower, and will therefore be looking for more cost effective supply alternatives than the present Brandon/helicopter service.

They have expressed keen interest in a Sound crossing operational within 2-3 years which would enable them to supply Fox Bay and Hill Cove by road from Port Howard (supplies, fuel and personnel) with onward supply to the sites by BV, landrover or helicopter. This would clearly be a significant complementary use for the Sound crossing, and one which was of benefit to both communities.

The question about Newhaven seems to be less about whether to put a road and jetty into Newhaven, than when would be the most appropriate timing.

Work could not begin on construction at Newhaven until the road had been built which currently stands in either 98/99 or 99/00; design could begin therefore concurrent with the road building, with construction following the road completion. By the time Newhaven was completed the West road would have been completed to Hill Cove/Roy Cove and be well on to Port Stephens, the East link roads would be completed and the main road to San Carlos half way through.

6.8 Deep Water Jetty

The most likely site for a deep water jetty for all practical marine purposes (rather than geographical location which might slightly favour Fox Bay) is Port Howard. It has better water depths and manoeuvrability which are doubtful at Fox Bay, and a lee shore. Geographically it is also more convenient for a link to Newhaven.

The deep water jetty at Port Howard could be commenced early in 1997 (design) for completion late 1998, by which time the West wool with the exception of the Port Stephens area, Shallow Harbour/Dunnose Head and Dunbar could be centralised at Port Howard. The economic argument for a deep water facility at Port Howard is no easier to make than the original arguments in favour of building roads - until it is done the effects will be arguable and hypothetical. It is clear from Section 5 however that to collect from Port Howard northbound is economically better for farmers so long as the shipping charges are similar to those from Stanley.

At this stage neither FIC or Hogg Robinson has been prepared to comment on likely shipping charges, though both have said they would use a suitable deep water facility and would be satisfied with a majority of farm labour as stevedores. It is not to be expected that either would firmly commit to using the facility at any given price until there was much more clarity on volumes, timing and the standard of facility.

Since it would appear that there would be substantial benefit to the West in there being such a facility it is recommended that a full location survey, preliminary design and costing be carried out as soon as possible with a view to construction in 97/98, and that a similar exercise be carried out for Newhaven for 4.5m and 6.5m depths at the end of the jetty. It is further recommended that FIG acquires options on land at Port Howard and Newhaven for the construction of jetties and warehousing.

6.9 **MV Tamar and MV Forrest**

6.9.1 **MV Tamar**

This vessel was purchased in 92/93 as the Leca Vest at about 10 years old; she was extensively surveyed, modified and upgraded to work in these waters and has performed her tasks extremely well and with good reliability.

The purpose of FIG/FIDC in purchasing the vessel was to have in place a multi-purpose craft which would be able to undertake the various tasks noted in section 6.6 for the following 5 years (ie until 1998) and then review her suitability against progress in the transport system.

All the possible changes that might occur in the Falklands internal transport arrangements up until the year 2000 are those that had been largely foreseen at the time of purchase. Tamar remains an appropriate vessel to carry out all activities until that time.

Should there be a deep water jetty constructed at Port Howard by 2000, and if wool were then transported directly northbound there might be a case for replacement if sufficient other trade (Punta Arenas, across the Sound, or servicing the hydrocarbons industry) had not developed, or had developed to such an extent that a more specialised vessel was required.

In the meantime we would recommend that Tamar be retained until 2000, at which time a further review would be necessary.

6.9.2 **MV Forrest**

The Forrest, though largely redundant, has been maintained and retained as a back-up vessel to the Tamar. In the event she has not been required, but has been able to fill in during maintenance periods and carry out occasional additional work.

She costs around £15,000 per annum to maintain, including mooring fees at East Jetty. Those operating the service feel more comfortable with a back-up vessel, though in emergency the MOD may assist with their coastal/tug vessels.

It is recommended that she be retained for a further period until it is clear whether there would be any work for her in support of the oil industry, or there are other support vessels in place which could in emergency back up the Tamar. She should then be sold.

7. AVIATION - FUTURE PROGRAMME

7.1 Operating Patterns

The operation of FIGAS has responded to changes brought about by the construction of roads (particularly on the East), by ceasing calls to those strips from which there is no longer any demand. They have been able to maintain total numbers of passengers carried however through the increases in tourist numbers particularly from MPA to key camp sites, and must expect this to be largely the pattern for the future.

Since FIGAS operates much as an on-call air taxi service, and the level of demand from day to day is largely unpredictable, there are limited opportunities for adopting schedules which are more cost-effective without reducing the level of service to the customer. The report assumes there is no wish by FIG to reduce the level of service in the pursuit of greater efficiency.

7.2 Airstrips

7.2.1 East Falkland Airstrips

Of the airstrips on the East, of which there are 12 in regular use

(a) 4 are Islands

Bleaker
Lively
Sea Lion
Speedwell

(b) 8 are multi-user strips

Douglas Station
Goose Green
North Arm
Port San Carlos
Salvador
San Carlos
Walker Creek
Mount Pleasant

Multi-user strips are those settlements where there is more than one family or farm using the strip, or several unconnected users flying into the strip. To this extent Sea Lion would also be regarded as a multi-user facility.

All the mainland strips are relatively well spaced and mostly adequate for their level of use; it is unlikely that roads can be used to force very much concentration of use, though it might be argued that Douglas for the North-East camp should be well maintained at public expense as the central location for that area.

Sea Lion Island remains a difficulty, as does San Carlos. Both have regular tourist traffic, though San Carlos will be increasingly better serviced by road and the demand will decrease for air use. Sea Lion is only likely to increase in use. The current airstrip is fine for the summer but unusable in the wetter winter conditions. It is important that priority be given to preparing an alternative well drained strip on Sea Lion (in an area already identified) to take the increasing level of traffic and to extend the tourist season to the Island.

7.2.2 West Falkland Airstrips

Of the airstrips on the West, of which there are 18 in regular use

(a) 8 are Islands

- Beaver
- Carcass
- Golding
- New Island
- Pebble
- Saunders
- Weddell
- West Point

Keppel and Sedge are licensed but not regularly used.

Of these Islands 3, Pebble, Saunders and Weddell, can be regarded as multi-user sites.

(b) 7 are multi-user strips

- Chartres
- Fox Bay
- Hill Cove
- Port Howard
- Roy Cove
- Port Stephens
- Shallow Harbour

- (c) 3 are single-user strips

Dunbar
Port Edgar
Spring Point

A further single user strip at Albemarle is in preparation but will take 2-3 years.

Of all the airfield facilities on the West that which causes most concern is Port Howard which attracts a high volume of traffic but for which both strips have limitations.

It is recommended that plans be drawn up to construct a 540m x 18m all weather strip with cross strip, using road building techniques, materials and equipment, at an estimated cost equivalent to 4 km of road or around £80,000. The location would be a matter for the DCA and the farm owner, but should be as close to the farm as possible for operational convenience and safety.

Plans should also be put in hand to similarly cover the new Fox Bay airstrip, which is currently an excellent facility but which may be prone to erosion. It is recommended that the degree of erosion be accurately measured and action taken to cover the base with road building materials if necessary.

7.3 Cost-Effective Operations

With the establishment of road networks and good all-weather airstrips comes the possibility of improving operating efficiency by encouraging customers to use particular airstrips on particular days, instead of FIGAS necessarily flying to all corners of the Islands every day. For instance it is not uncommon for FIGAS to call at Port Howard or Fox Bay every day of the week when the passengers might happily have flown on only two or three of those days.

Whilst there should be no attempt to deny camp-dwellers or visitors the existing level of service provided by FIGAS, encouragement to passengers to fly on particular days can be given through the application of differential tariffs. For instance if it cost £35 to fly to/from Port Howard, Pebble, Saunders and Hill Cove on a Monday, Wednesday and Friday, but £45 on other days there would be far more tendency for passengers to group on those days. Similarly Fox Bay, Weddell and Port Stephens might have the discounted fare on a Tuesday, Thursday and Saturday.

Whilst total revenue to FIGAS from this approach might reduce slightly (around 5% of passenger revenue), total flying miles should also reduce and passenger density increase. It is also the case that passengers in other areas

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(eg the Chartres area) would benefit by being able to travel to either Port Howard or Fox Bay for the cheaper flight (and reduce use of the Chartres strip which is very poor when wet).

7.4 Seasonal Traffic

Like most major activities in the Falklands FIGAS must set its physical and human resources to meet peak demand and maintain unutilised resources during the "low" season. In terms of passenger activity there is very substantially more movement during the Spring/Summer than the Autumn/Winter seasons.

Passenger Movements

	Oct-Mar	Apr-Sept	Nov-Apr	May-Oct
90/91	63%	37%	64%	36%
91/92	61%	39%	62%	38%
92/93	68%	32%	70%	30%
93/94	68%	32%	67%	33%
94/95	67%	33%	69%	31%

This trend is created by most classes of non-business travel, but most particularly by Stanley residents - presumably going to camp for leisure purposes - and overseas tourists. The trend exists for military tourists but to a lesser extent.

In terms of resource utilisation there is no complementarity of airframes between passenger activity and fisheries. Usage of passenger airframes would follow the trend indicated above; fisheries airframes have a busy season from mid-March to end May (during the Illex season) and then reduce substantially.

There is some complementarity in flying and engineering resources in that the busy fisheries season comes after the busy tourist season, leaving the slack period for pilots end May to early November, with the engineers busiest when the airframes are freer.

There is no ready solution to this seasonality other than flying longer hours in the peak periods and bringing locum pilots to supplement where necessary. Locum pilots particularly can take up the summer fisheries duties leaving the regular experienced pilots to fly the passenger flights.

The important factor for FIGAS (and the DCA) is that this seasonality is likely to increase, and could increase dramatically if the DAP 727 service from Punta Arenas becomes successful and delivers significant numbers of

additional tourists from the area, who would wish to visit probably two of the main tourist sites during a one week visit.

It is recommended that both FIGAS and the DCA have in hand contingency plans for additional pilot hours and additional ATC/airport staff to keep Stanley airport open longer hours during the peak summer months.

7.5 Customer Service

There are regular calls from the tourist industry for the air service to be more conscious of the need for tourists to maximise their time at tourist destinations, and for tourist movements as far as is possible to be either early or late in the day.

Given that there is no lack of will by the air services to provide the best possible service to its customers within the bounds of safety, resource and given commercial parameters, there is reason to believe that the proposals in Sections 7.3 and 7.4 together with more flexible airport operation can deliver the level of service required.

It is recommended that both FIGAS and DCA examine the opportunities for greater flexibility and customer service through the application of revised shift patterns for pilots, engineers and airport staff.

7.6 Airframes

7.6.1 Fixed Wing

There is universal agreement that the existing BN Islander airframes are the most appropriate available for the tasks to be undertaken in the Falklands, and there is at present no demand for anything larger. However the effects of the proposals of section 7.3 if implemented, plus possible growth in the tourist industry could result in passenger movements which exceed the capacity of the Islander (normally 8 pax to the better airstrips).

Should regular summer usage to the principal destinations begin to regularly exceed 8, consideration might be given to the seasonal charter of a Twin Otter (passenger capacity 17) which is equally robust and can generally use the same airstrips as the Islander (subject to loading and conditions).

The additional complications of the Otter would be that for flights carrying over 12 passengers it requires two pilots, and that it would require different fuel to the Islander. Obviously engineering training would be required and additional spares (which however should be provided with the charter).

Therefore until such time as more than two Islanders are being regularly required for particular runs there does not appear to be sufficient justification for a larger airframe. It would however make sense for the engineering capability of FIGAS to be upgraded to be able to handle the Twin Otter.

7.6.2 Rotary Wing

Many of the difficulties which are experienced at some destinations in terms of airstrips would be alleviated by the availability of a helicopter service. Whilst some may consider this fanciful because of the substantially higher operating cost of helicopters (about double the cost per hour of the Islander), it is an element of the transport infrastructure which should be borne in mind in relation to

- (a) the development of the tourism industry, in which case a seasonal charter might prove feasible;
- (b) the future of the offshore oil industry, in which case helicopters will be essential. The configuration for these however might be inappropriate for local or tourist use;
- (c) the provision of air services to remote locations and islands where there is currently no air access or the Islander operates on the margins of safety.

Any future economic review of the FIGAS operation should consider the place for a six-seater helicopter in the fleet or on a charter basis.

8. CAPITAL COST SUMMARIES

The capital cost estimates and summaries which follow are based on the following:

- (a) spine roads are costed at £30,000/km. This reflects the current average road building direct cost of £19,000/km, plus £8,000/km for cost of plant and maintenance, plus contingency of £3,000/km for probable plant and labour cost increases.
- (b) link roads are costed at £30,000/km where they are built by a main contractor, and £20,000/km for the Option A on the West where they are built by an enhanced flying squad.
- (c) link roads would not necessarily be continuous road, and they are not therefore costed for total distance.
- (d) the estimated costs have been applied to the construction times which have been broadly agreed with PWD. We are not wholly confident that the programmes and capital estimate tie up correctly, and would advise further work in this area if a more accurate costing is required.
- (e) the more expensive option on the West (2 contractors) has been used in the cost estimates for West link roads. Whilst it has been assumed that on both West and East new contractors can be engaged for £30,000/km this is unclear at this stage.
- (f) the construction of the Newhaven terminal is timed to follow the earliest completion of the road to Newhaven, and in order to be operational as soon as possible after the completion of the abattoir.
- (g) an allowance is made in 97/98 for upgrading Sea Lion and Douglas airfields.
- (h) the construction of the Port Howard terminal (deep water jetty) is timed to complete after the Hill Cove link is completed and (under the 2 contractor option) the Fox Bay-Port Stephens road would be half complete. The Newhaven terminal would also be completed.
- (i) an allowance is made in 97/98 for the construction of an airstrip at Port Howard.
- (j) allowance is made of £100,000 per annum from 97/98 through 99/00 for completion of upgrading of jetties at key ports (if required) and providing adequate facilities on the principal islands.

Table 20 - Estimated Capital Costs

<u>East</u>	<u>£'000</u>	
DARWIN-NORTH ARM - 50km	1500	
NEWHAVEN - 15km	450	
SAN CARLOS - 25km (partially complete)	375	
SAN CARLOS-GREENFIELD - 10km	300	
WALKER CREEK - 25km	750	3375
SALADERO	75	
CAPE DOLPHIN	300	
GREENFIELD	200	
BOMBILLA	100	
JOHNSONS HARBOUR	100	
VOLUNTEER	375	
RINCON GRANDE	150	
SALVADOR	500	
MURRELL	200	
LONG ISLAND	10	
BROOKFIELD	5	
MOSS SIDE	5	
WRECK POINT	5	2025
Sub-total		5400

<u>West</u>	<u>£'000</u>	
HILL COVE - 25km	750	
ROY COVE - 15km	450	
PORT STEPHENS - 70km	2100	
SHALLOW HARBOUR - 45km	1350	
	4650	
		<u>2nd</u>
		<u>Contractor</u>
		<u>Option</u>
MAIN POINT/SHALLOW BAY	80	120
SHEFFIELD	95	140
DUNBAR	135	200
WESTLEY	35	50
PHILOMEL	15	20
EAST BAY	105	160
SPRING POINT	60	80
PORT EDGAR	105	160
SOUTH HARBOUR	65	100
ALBEMARLE	265	400
PORT HOWARD JETTY	150	150
	1110	1580
Sub-total	5760	6230

TOTAL COST

EAST	5400	
WEST	5760	or 6230
TOTAL	11160	or 11630

Table 21 - Capital Cost Summary - Roads (£'000)

	96/97	97/98	98/99	99/00	00/01	01/02	02/03	03/04	04/05	05/06
East Spine Roads	400	400	400	400	350	350	350	375	350	
East Link Roads	275	275	275	250	250	235	235	230		
West Spine Roads	465	465	465	465	465	465	465	465	465	
West Link Roads	200	200	200	200	200	200	200	180		
TOTAL	1340	1340	1340	1315	1265	1250	1250	1250	815	465

SUM TOTAL £11,630,000

Table 22 - Overall Capital Cost Summary (£'000)

	96/97	97/98	98/99	99/00	00/01	01/02	02/03	03/04	04/05	05/06
East Spine Roads	400	400	400	400	350	350	350	375	350	
East Link Roads	275	275	275	250	250	235	235	230		
Newhaven Terminal		35	350							
East Airstrips	10	50	10	10	10	10	10	10	10	10
West Spine Roads	465	465	465	465	465	465	465	465	465	465
West Link Roads	200	200	200	200	200	200	200	180		
Port Howard Terminal	50	300	200							
West Airstrips	20	100	20	20	20	20	20	20	20	20
Jetties	150	100	100	100	30	30	30	30	30	30
TOTAL	1570	1925	2020	1445	1325	1310	1310	1310	875	525

SUM TOTAL £13,615,000

Internal Transport Review for the Falkland Islands Government

9. **THE TRANSPORT ADVISORY COMMITTEE**

- 9.1 Though consideration of the role of the TAC itself is not required by the terms of reference, we consider that if transport issues are to be properly co-ordinated during this next period of relatively rapid change, certain modifications to the TAC and improved communication between the various other bodies which currently work on transport issues will be required.

Currently active committees in the field include:

Transport Advisory Committee
FIGAS Users Group
FIGAS Management Committee
Byron Marine Users Group

There is not necessarily any communality of membership between these groups, and scope exists for duplication and/or divergence of policy and direction, particularly between TAC and the FIGAS Management Group.

We would recommend that one person be deputed to sit on all of these groups (possibly GMFIDC) to ensure that there is full sharing of information and unity of purpose between the groups.

- 9.2 It is also noticeable that the TAC has become very roads orientated, with limited time devoted to marine transport issues and even less to aviation issues.

It is recommended that FIGAS be properly represented on the TAC, and that as a matter of course marine and aviation issues are discussed in full at least half yearly to review progress, trends, changes and future plans.

10. **CONCLUSIONS AND RECOMMENDATIONS**

10.1 **Current Situation**

10.1.1 Virtually all of the proposals of the Internal Transport Action Plan of 1989 have been implemented or started, and much has been done in addition. Only the recommendations for a link across the Sound remain largely unimplemented.

The Transport Advisory Committee noted that where the Transport Review mentions "Sound" this refers to Falkland Sound.

10.1.2 The basis of the internal transport plan is that there should be a system of spine roads between the principal settlements/ports, with link roads to outlying areas.

Agreed by the Transport Advisory Committee.

10.1.3 The road system will continue to be complemented by the coastal shipping service and FIGAS.

Agreed by the Transport Advisory Committee.

10.1.4 The operation of the coastal shipping service has been carried out effectively by Byron Marine since January 1993. The operating pattern on the East has changed markedly with the progress of roads, but there has been little change on the West. Trade from Punta Arenas has grown steadily.

Agreed by the Transport Advisory Committee.

10.1.5 FIGAS patterns have also changed markedly on the East, but not on the West. Loss of business to the East roads has been replaced by additional business from MPA.

Agreed by the Transport Advisory Committee.

10.1.6 Resources committed to the transport system to date are:

Capital Expenditure - £19.2 million

Recurrent Expenditure (95/96) - £0.87 million

The Transport Advisory Committee felt the Transport Review did not address the additional recurrent expenditure which would be required to reflect increased maintenance as the road network progressed. The Transport Advisory Committee recommend that the Public Works Department be requested to provide these figures.

10.2 Roads and Tracks - Future Programme

10.2.1 Most of the self-help schemes which can be undertaken have been completed; there is much greater pressure on public resources for completion of link roads. More resources will be required if the road programme is to be completed to enhanced expectations within the next 10 years.

The Transport Advisory Committee believe the greater allocation of resources would result in quicker completion but the total cost would be greater if the programme was accelerated. It will be necessary to strike a balance between the increase in costs and the additional utility of earlier completion.

10.2.2 Prioritisation of spine roads is relatively clear; prioritisation of link roads is far less so in changed circumstances.

TAC is **recommended** to reconsider how priorities for link roads are determined based on factors presented herein.

The Transport Advisory Committee recommend a sub-committee, comprising Hon Mrs S Halford, GM FIDC, Director of Civil Aviation and a representative from Byron Marine Ltd, be established to determine the priorities for link road construction; the sub-committee's recommendation will be forwarded to Executive Council by the Transport Advisory Committee.

10.2.3 There is some danger on the East that pressure for link roads will overtake spine road works.

TAC is **recommended** to reconfirm the primacy of spine roads over link roads, and ensure resources are so directed.

The Transport Advisory Committee reconfirmed the primacy of spine roads over link roads.

Internal Transport Review for the Falkland Islands Government

- 10.2.4 It is **recommended** that the design axle weight for all spine roads should be not less than 5T, and that sub-base preparation should be adequate for further upgrading.

Agreed by the Transport Advisory Committee.

- 10.2.5 It is **recommended** that full terms of reference for the construction of link roads and their use be adopted immediately, paying particular attention to standard/speed of construction/cost.

The Transport Advisory Committee recommended that all link roads should be continuous, that the design axle weight should be not less than 2T, and that maintenance should be undertaken at public expense.

- 10.2.6 It is **recommended** that there be a deep water jetty at Port Howard (if technically feasible) and that this be the collection point for West wool northbound.

Agreed by the Transport Advisory Committee. The Transport Advisory Committee also recommended that Newhaven should be the East Falkland terminal for a ferry link across Falkland Sound and that if appropriate this be extended to include a deep water port facility.

- 10.2.7 It is **recommended** that the East spine roads be completed in accordance with Table 11 - Newhaven-North Arm-San Carlos-Port San Carlos-Walker Creek, and if necessary additional resources brought in to complete the programme.

The Transport Advisory Committee recommended East spine roads should be completed in the order Newhaven-North Arm-Walker Creek-San Carlos-Port San Carlos.

Executive Council agreed that the spine road to Newhaven should be the last to be completed. The Attorney General told Honourable Members that he had been informed by Byron Marine Ltd that the Port San Carlos jetty was in a poor state of repair. Repairs would need to be undertaken if it was to be used as a ferry head.

- 10.2.8 Following the determination of priorities (see 10.2.2) a firm timetable should be adopted for the completion of East link roads.

Agreed by the Transport Advisory Committee.

- 10.2.9 It is **recommended** that early consideration be given to resource allocation on the West (one main contractor for spine roads and a secondary link roads team, or two fully resourced main contractors, one for the northern area and one for the southern area). The additional cost of two contractors would be £450-500,000; overall construction time might reduce marginally, but more people would benefit from a much earlier stage. In view of the limited additional cost this is **recommended** as the preferred option.

The Transport Advisory Committee support the provision of two fully resourced main contractors but believe the additional costs noted above are understated.

Councillor Summers advised that because of the recommendations of the TAC in 10.2.5, the above mentioned costs will be substantially higher.

- 10.2.10 It is therefore **recommended** that the schedule for West spine roads and link roads are those set out in Tables 15 and 15A.

The Transport Advisory Committee suggest that the schedule be deferred pending the sub-committee's recommendations.

- 10.2.11 It is further **recommended** that an overall programme be adopted as shown in Table 18.

The Transport Advisory Committee suggest the overall programme be deferred pending the sub-committee's recommendations.

- 10.2.12 It is further strongly **recommended** that whichever schedule options are adopted they be adopted in full, and that PWD be mandated to implement a 3 year forward rolling programme so that time delays and resource shortages are minimised, and best contractor prices can be obtained.

Agreed by the Transport Advisory Committee.

10.3 **Inter Island Shipping**

- 10.3.1 It is **recommended** that the key port concept for inter island shipping be formally adopted and that tariff structures are formulated to promote and support the concept.

The Transport Advisory Committee support the key port concept but recommend such key ports should also include secure warehousing and fuel supply facilities.

Internal Transport Review for the Falkland Islands Government

- 10.3.2 It is **recommended** that the principal islands be given assistance for the provision of adequate jetty facilities.

The Transport Advisory Committee recommend that all-tide bearing jetty facilities be provided at principal islands and all-tide seatruck facilities be provided at non-principal islands with maintenance being undertaken at public expense as with roads.

- 10.3.3 It is **recommended** that Byron Marine be invited to submit proposals for revised schedules based on the key port concept (this will require a phased introduction as roads proceed), incorporating planned sound crossings and additional Punta Arenas visits.

Agreed by the Transport Advisory Committee.

- 10.3.4 It is **recommended** that full location surveys, preliminary designs and costings be carried out for a deep water jetty at Port Howard and a jetty at Newhaven (possibly using '93 and '94 Stabex transfers), and that dialogue be opened with Port Howard Farm Ltd and Falklands Landholdings Ltd on the acquisition of the agreed sites.

The Transport Advisory Committee recommend that surveys be undertaken in conjunction with Byron Marine Ltd. They noted that deep water ports would be those with a water depth at the berth in excess of seven metres.

Executive Council agreed that a survey should be undertaken at Fox Bay at the same time. The Commander British Forces undertook to attempt to obtain copies of surveys already undertaken by the Navy in the past.

- 10.3.5 It is **recommended** that Tamar be retained until 2000, at which time a further review of her continued suitability will be necessary, and that Forrest be retained for a limited period, and if there is no work for her she be sold.

The Transport Advisory Committee recommend that Forrest be retained for the foreseeable future as an insurance policy and for use on short term contract work.

Executive Council agreed that the Tamar should be retained until 2000, at which time a further review of her continued suitability will be necessary.

10.4 **Aviation**

- 10.4.1 It is **recommended** that priority be given to preparing an alternative well drained airstrip on Sea Lion, a new airstrip be constructed at Port Howard, Fox Bay be closely monitored and covered if necessary and consideration be given to maintaining a good quality strip at Douglas.

Agreed by the Transport Advisory Committee.

- 10.4.2 It is **recommended** that FIGAS promote more cost-effective usage of aircraft by offering differential tariffs to fly to/from certain areas on certain days.

Agreed by the Transport Advisory Committee.

- 10.4.3 It is **recommended** that both FIGAS and DCA have in hand plans for revised shift patterns for pilots, engineers and airport staff to cope with longer flying hours in the peak summer months. Increased use of locum pilots and engineers may be necessary.

Agreed by the Transport Advisory Committee.

- 10.4.4 It is not considered appropriate at present for alternative airframes to be introduced, but engineering capability on Twin Otters should be obtained if possible, and the introduction of a rotary wing aircraft made as soon as economically viable.

The Transport Advisory Committee do not support obtaining engineering capability on Twin Otters until such time as those aircraft are included in the FIGAS fleet.

10.5 **Capital Cost Summary**

- 10.5.1 It is **recommended** that funding be planned for the next 10 years of £13.615m (at constant '96 prices), with a maximum annual cost of £2.02m in 98/99.

The Transport Advisory Committee feel these costs are conservative and should therefore be treated with a great deal of caution.

10.6 **Transport Advisory Committee**

- 10.6.1 It is **recommended** that there be closer co-ordination between the TAC and other transport-orientated committees, and that the TAC ensures there is consistency of purpose and action in developing the transport network.

The Transport Advisory Committee recommend the inclusion of a representative from FIGAS in their membership.

It was agreed that more detailed planning was required and the increases to the Capital costs would need to be recalculated by the Transport Advisory Committee before the Review is released to the General Public. The views of the Committee on link roads are to be incorporated into the Report before it is issued.

Executive Council did not wish to hold up the release of the Review pending re-evaluation of capital costs. However it should be noted that due to technical changes in link road construction and increased cost of external contractors for spine roads the capital costs in Section 8 of the Review are substantially understated.

11. **LIST OF TABLES**

Table	1	Wool Carriage by Sea 1989/90 - 1996/97
	2	Ports in Continuing Use, More than 20,000 kg of Wool
	3	Cargo from Punta Arenas
	4	FIGAS Summary of Landings 1989-95
	5	FIGAS Summary of Passenger Usage 1990-95
	6	FIGAS Summary of Freight Carriage 1992-95
	7	Possible Wool Movements - East Falkland
	8	East Falkland Wool - Summary
	9	Possible Wool Movements - West Falkland
	10	West Falkland Wool - Summary
	11	East Spine Roads - Timetable I
	11A	East Spine Roads - Timetable II
	12	East Link Roads - Timetable I
	12A	East Link Roads - Timetable II
	13	West Spine Roads - Timetable One Main Contractor Option
	14	West Link Roads - Timetable One Main Contractor Option
	15	West Roads - Two Contractor Option, North West
	15A	West Roads - Two Contractor Option, South West
	16	Roads - Overall Programme I
	17	Roads - Overall Programme II
	18	Roads - Overall Programme III
	19	Roads - Overall Programme IV
	20	Roads and Link Roads Estimated Capital Cost
	21	Capital Cost Summary - Roads
	22	Overall Capital Cost Summary

12. ATTACHMENTS

- 12.1 Internal Transport Action Plan
- Costed Implementation Plan (ref 2.1(7))
- 12.2 Byron Marine Schedule 1995 (ref 3.2.2)
- 12.3 Status Report on Jetties 6.5.96 (ref 3.2.3)
- 12.4 Terms of Reference, Camp Link Roads (ref 5.4.1)
- 12.5 East Falkland Link Track Priorities (report of sub-committee of Transport Advisory Committee) 8.4.97

ATTACHMENT 12.1

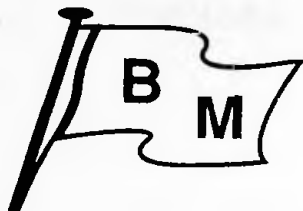
Table 8.2(a)
Implementation of Transport Action Plan (\$000)

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Total
<u>Camp Tracks - First Phase</u>											
Engagement of consultants	50	100	100	100	50						400
Contract proposals											
Mobilisation of plant and equipment		1250									1250
<u>Construction</u>											
Mount Pleasant - Darwin											
Port Howard - Chartres		750	1500	1500	750						4500
Chartres - Hill Cove											
Chartres - Fox Bay											
<u>Camp Tracks - Second Phase</u>											
Feasibility study (including East-West Ferry)			25								25
Engagement of consultants						50	100	100	100	50	400
Contract proposals							1250	750	1500	750	4500
Mobilisation of plant and equipment											
Construction											
<u>Assistance Camp Link Roads (1)</u>											
East-West Ferry (2)			100	260	410				770		
Coastal Shipping (3)	40	40	40	35	30	30	30	25	25	25	320
Camp Airstrip Improvement (3)	70	70	70	70	60	60	60	60	60	50	630
	235	2285	1910	2040	1375	215	2265	1760	1760	950	14795

(1) After completion of construction to Green Patch/Malo Bridge.

(2) Assumes pattern of expenditure in current capital expenditure estimates.

(3) Assistance for maintenance of jetties and airstrips set at realistic level, but reduces as number of facilities is reduced.

**Byron Marine Limited**

Waverley House
Stanley
Falkland Islands
Tel: (500) 22245
Fax: (500) 22246

MV TAMAR FI

ITINERARY SCHEDULE FOR 1995 CALENDAR YEAR

THIS LISTING INCLUDES ALL PORTS OFFERED A CALL, BUT IN SOME INSTANCES, IN WINTER TIME NON-RESIDENT PORT OWNERS MAY ASK FOR THE VESSEL NOT TO CALL. SUCH OCCURRENCES ARE ISOLATED AND DO NOT IMPOSE BURDEN UPON, OR RESTRICTION TO, THE VESSELS OPERATING SCHEDULE AS ADVERTISED.

VOYAGE 1/95 Sailing Monday 2nd January -
For crossings on Tuesday 3rd January

FALKLAND SOUND NEW YEAR FERRY CROSSING

VOYAGE 2 Cargo Closing Friday 30th December 1200 hrs
Sailing Wednesday 4th January 1995

ROY COVE	CHARTRES	SHEFFIELD	DUNNOSE HEAD
SPRING POINT	DOUBLE CREEK	WEDDELL IS.	BEAVER IS.
	NEW ISLAND	PORT STEPHENS	

A Member of the Falkland Islands' Chamber of Commerce

DIRECTORS: D. A. HALL S. P. CLIFTON D. J. ALLAN D. L. CLIFTON

VOYAGE 3 Cargo Closing Monday 9th January 1200 hrs
 Sailing Wednesday 11th January

SAN SALVADOR SAN CARLOS PORT HOWARD
 PORT SUSSEX AJAX BAY

VOYAGE 4 Cargo Closing Friday 13th January 1200 hrs
 Sailing Tuesday 17th January

LIVELY IS. WALKER CREEK BLEAKER IS. SEA LION IS.
NORTH ARM SPEEDWELL IS. FOX BAY EAST FOX BAY WEST
PORT EDGAR PORT STEPHENS RUGGLES/GREAT IS.

VOYAGE 5 Cargo Closing Thursday 19th January 1200 hrs
 Sailing Monday 23rd January

PEBBLE IS. GOLDING IS. SAUNDERS IS. HILL COVE
DUNBAR WEST POINT CARCASS PORT SAN CARLOS
(PEBBLE TO BE WORKED BY SEA TRUCK)

VOYAGE 6 Cargo Closing Thursday 2nd February 1200 hrs
 Sailing Sunday 5th February

PUNTA ARENAS

From this voyage on, at this stage, voyage details should be regarded as provisional and are supplied subject to later change.

VOYAGE 7 Sailing Saturday 18th February -
 For crossings on Sunday 19th February

SPORTS WEEK FERRY CROSSING then onwards to
Sea Lion Island and vicinity for -

NATIONAL STUD FLOCK SHEEP MOVEMENTS

Then: Sailing Saturday 25th February -
 For crossings on Sunday 26th February

SPORTS WEEK FERRY CROSSING

VOYAGE 8 Cargo Closing Friday 24th February 1200 hrs
 Sailing Tuesday 28th February

ROY COVE CHARTRES SHEFFIELD DUNNOSE HEAD
SPRING POINT DOUBLE CREEK WEDDELL IS. BEAVER IS. NEW IS.

VOYAGE 9 Cargo Closing Friday 3rd March 1200 hrs
 Sailing Tuesday 7th March

 AJAX BAY PORT SUSSEX SAN CARLOS PORT HOWARD
 SWAN ISLAND SALVADOR JOHNSONS HARBOUR

VOYAGE 10 Cargo Closing Thursday 9th March 1200 hrs
 Sailing Monday 13th March

FOX BAY EAST FOX BAY WEST PORT EDGAR SPEEDWELL IS.
 GEORGE/BARREN IS. RUGGLES/GREAT IS. PORT STEPHENS

VOYAGE 11 Cargo Closing Thursday 16th March 1200 hrs
 Sailing Monday 20th March

PEBBLE IS. GOLDING IS. SAUNDERS IS. HILL COVE DUNBAR
 CARCASS WEST POINT PORT SAN CARLOS

VOYAGE 12 Cargo Closing Friday 24th March 1200 hrs
 Sailing Tuesday 28th March

 WALKER CREEK LIVELY IS. BLEAKER IS.
 SEA LION IS. NORTH ARM

VOYAGE 13 Cargo Closing Thursday 30th March 1200 hrs
 Sailing Monday 3rd April

CHARTRES SHEFFIELD DUNNOSE HEAD ROY COVE SPRING POINT
 DOUBLE CREEK WEDDELL IS. BEAVER IS. NEW IS. PT. STEPHENS

VOYAGE 14 Cargo Closing Monday 10th April 1200 hrs
 Sailing Wednesday 12th April

 PUNTA ARENAS

**MAIN ENGINE OVERHAUL AND SURVEY PERIOD - 24TH APRIL 1995 -
 15TH MAY 1995. VESSEL TO REMAIN IN STANLEY.**

VOYAGE 15Cargo Closing
SailingThursday 11th May 1200 hrs
Monday 15th May

JOHNSONS HARBOUR SALVADOR SAN CARLOS
 PORT SAN CARLOS PORT HOWARD
 (AJAX BAY, SWAN ISLAND AND PORT SUSSEX IF REQUIRED)

VOYAGE 16Cargo Closing
SailingThursday 18th May 1200 hrs
Monday 22nd May

LIVELY IS. WALKER CREEK BLEAKER IS. SEA LION IS.
 NORTH ARM SPEEDWELL IS. FOX BAY EAST FOX BAY WEST
 PORT EDGAR (RUGGLES/GREAT IS. IF REQUIRED)

VOYAGE 17Cargo Closing
SailingThursday 25th May 1200 hrs
Tuesday 30th May

PEBBLE IS. GOLDING IS. SAUNDERS IS. HILL COVE DUNBAR
 CARCASS WEST POINT ROY COVE SHEFFIELD CHARTRES
 DUNNOSE HEAD SPRING POINT DOUBLE CREEK WEDDELL IS.
 NEW IS. BEAVER IS. PORT STEPHENS

VOYAGE 18Cargo Closing
SailingThursday 8th June 1200 hrs
Monday 12th June 1994

PUNTA ARENAS



Byron Marine Limited

Waverley House
Stanley
Falkland Islands
Tel: (500) 22245
Fax: (500) 22246

ITINERARY JUNE 1995 - FEBRUARY 1996

CIRCULAR: TO ALL CUSTOMERS

Please contact our office at Waverley House should you have any queries regarding the itinerary.

VOYAGE 19

Cargo Closing: Thursday 29th June 1200 hrs
Sailing: Monday 3rd July

JOHNSONS HARBOUR SAN SALVADOR PORT SAN CARLOS
SAN CARLOS PORT HOWARD AJAX BAY SAUNDERS IS.
(SHEEP EX SAUNDERS TO STANLEY)

VOYAGE 20

Cargo Closing: Thursday 6th July 1200 hrs
Sailing: Monday 10th July

LIVELY IS. WALKER CREEK BLEAKER IS. SEA LION IS. NORTH ARM
SPEEDWELL IS. F.BAY EAST F.BAY WEST PORT EDGAR PT.HOWARD
(CATTLE PT. HOWARD TO STANLEY)

VOYAGE 21

Cargo Closing: Thursday 13th July 1200 hrs
Sailing: Tuesday 18th July

PT. STEPHENS WEDDELL IS. BEAVER IS. NEW IS. STONEY RIDGE SPRING POINT
DUNNOSE HEAD CHARTRES SHEFFIELD ROY COVE WEST POINT CARCASS IS.
DUNBAR HILL COVE SAUNDERS IS. GOLDING IS. PEBBLE IS.
(PT. STEPHENS FIRST PORT) (BEEF HILL COVE TO STANLEY)

VOYAGE 22

Cargo Closing: Wednesday 26th July 1200 hrs
Sailing: Monday 31st July

PUNTA ARENAS

VOYAGE 23

Cargo Closing: Thursday 17th August 1200 hrs
Sailing: Monday 21st August

JOHNSONS HARBOUR SAN SALVADOR PORT SAN CARLOS SAN CARLOS
PORT HOWARD AJAX BAY PEBBLE IS.
(SHEEP EX PEBBLE TO STANLEY)

A Member of the Falkland Islands' Chamber of Commerce

DIRECTORS: D. A. HALL S. P. CLIFTON D. J. ALLAN D. L. CLIFTON

VOYAGE 24

Cargo Closing: Thursday 24th August 1200 hrs

Sailing: Monday 28th August

LIVELY IS. WALKER CREEK BLEAKER IS. SEA LION IS. NORTH ARM
SPEEDWELL IS. F.BAY EAST F.BAY WEST PORT HOWARD
PORT EDGAR (CATTLE PT. HOWARD TO STANLEY)

VOYAGE 25

Cargo Closing: Thursday 31st August 1200 hrs

Sailing: Tuesday 5th September

PEBBLE IS. GOLDING IS. SAUNDERS IS. HILL COVE DUNBAR CARCASS IS.
WEST POINT ROY COVE SHEFFIELD CHARTRES DUNNOSE HEAD
SPRING POINT STONEY RIDGE NEW ISLAND WEDDELL IS.
BEAVER IS. PORT STEPHENS (PEBBLE FIRST PORT)

VOYAGE 26

Cargo Closing: Wednesday 20th September 1200 hrs

Sailing: Sunday 24th September

PUNTA ARENAS - DRY DOCKING

**VOYAGE DETAILS SHOULD BE REGARDED AS PROVISIONAL ONLY,
FROM THIS VOYAGE ON, AND ARE SUPPLIED SUBJECT TO ALTERATION**

VOYAGE 27

Cargo Closing: Thursday 19th October 1200 hrs

Sailing: Tuesday 24th October

LIVELY IS. WALKER CREEK BLEAKER IS. SEA LION IS. NORTH ARM
SPEEDWELL IS. F. BAY EAST F.BAY WEST PORT EDGAR

VOYAGE 28

Cargo Closing: Thursday 26th October 1600 hrs

Sailing: Tuesday 31st October

PT. STEPHENS WEDDELL IS. NEW IS. STONEY RIDGE BEAVER IS. DUNNOSE HEAD
SPRING POINT CHARTRES SHEFFIELD ROY COVE WEST POINT CARCASS IS. DUNBAR
HILL COVE SAUNDERS IS. GOLDING IS. PEBBLE IS.
(PORT STEPHENS FIRST PORT)

VOYAGE 29

Cargo Closing: Thursday 9th November 1200hrs

Sailing: Sunday 12th November

SAN SALVADOR SAN CARLOS PORT SAN CARLOS PORT HOWARD
JOHNSONS HBR. AJAX BAY

VOYAGE 30

Cargo Closing: Wednesday 15th November 1200 hrs
Sailing: Monday 20th November

PUNTA ARENAS

VOYAGE 31

Cargo Closing: Thursday 30th November 1200 hrs
Sailing: Monday 4th December

LIVELY IS. WALKER CREEK BLEAKER IS. SEA LION IS.
SPEEDWELL IS. F.BAY EAST F.BAY WEST PORT EDGAR NORTH ARM

VOYAGE 32

Cargo Closing: Thursday 7th December 1200 hrs
Sailing: Tuesday 12th December

PEBBLE IS. GOLDING IS. SAUNDERS IS. HILL COVE DUNBAR
CARCASS IS. WEST POINT PORT SAN CARLOS

VOYAGE 33

Cargo Closing: Friday 15th December 1200 hrs
Sailing: Tuesday 19th December

JOHNSONS HARBOUR

VOYAGE 34

Sailing: Thursday 21st December
For crossings on: Friday 22nd December

FALKLAND SOUND CHRISTMAS FERRY CROSSING

Public Works Department

STABEX SELF HELP JETTY SCHEME

Circular to Farmers Involved with Scheme

Current Status & Way Forward

The scheme, initiated by FIDC with the "Jetty Questionnaire" for the supply of materials, is now being reviewed by PWD. The attached spreadsheet is an overview of the whole scheme (24 port or jetty sites) and sets out the current status of each location.

Details of the works at each location are not covered by the spreadsheet, and these will be agreed between the owner and PWD. Currently several schemes have been discussed in some detail, and others no contact made.

Where new works or modifications to existing jetties are proposed, these will be discussed by PWD with Byron Marine before approval is given.

The spreadsheet aims to define the way forward for each location. This is either approval to proceed, or need for further investigation to agree the scope of works required.

Materials are not referred to on the spreadsheet. Locations that have approval, and have all their materials (from the FIDC questionnaire) can carry out the works. Locations with approval but awaiting materials are asked to contact PWD who will arrange for supply.

Once all materials are supplied to a site, the timing of the works will be agreed. The farmer will be required to enter into a Bond Form to confirm that the materials will be used in the jetty works. The Department of Agriculture have administrative control of this part of the scheme and will generate the Bond Form. A latest finish date for use of the materials will be set for each location.

Please contact Martin Young at PWD with any queries relating to the above.

6th May 1996

copy: Chairman & Members, Transport Advisory Committee
M.Forrest, Director of Public Works
M.McLeod, Department of Agriculture
Capt. S.Clifton, Byron Marine

Location	Owners Assessment - Scope of Works				PWD Assessment			Approval in Principal To Proceed	
	piles	cap beams	decking	concrete ramp	inspected	agree scope of works	self help	still needed	YES
Albermarle	◆	◆	◆	◆				feasibility report	YES
Beaver Island	◆	◆			02/11/95	NO - ramp	yes	feasibility report	
Bleaker Island		◆	◆	◆				feasibility report	
Carcass Island				◆	11/03/96	yes	yes		yes
Dunbar				◆	04/11/95	yes	yes		yes
Dunnose Head	◆	◆	◆		03/11/95	NO - ramp?	yes	feasibility report	
Johnsons Harbour	◆	◆	◆					feasibility report	
Lively Island	◆	◆	◆	◆	29/02/96	feasibility done	NO		
New Island				◆	02/11/95	yes	yes	inspection	yes
North Arm			◆					inspection	yes
Pebble Island	◆	◆	◆		05/11/95	yes	NO	feasibility report	
Port Edgar			◆					inspection	yes
Port Howard		◆	◆					inspection	yes
Port San Carlos	◆	◆	◆					feasibility report	
Port Stephens				◆	01/11/95	yes	yes		yes
Roy Cove					04/11/95	NO - repairs needed			
Saunders Island				◆	05/11/95	yes	yes		yes
Sheffield						ramp?		inspection	
Speedwell Island			◆					inspection	yes
Spring Point			◆	◆	03/11/95	yes	yes		yes
Stoney Ridge									
Walker Creek			◆					inspection	yes
Weddell Island	◆	◆	◆	◆	02/11/95	yes	NO	feasibility report	
West Point Island				◆	04/11/95	yes	yes		yes

CAMP ROADS - ADVANCE WORKS AND LINK ROADS**AGREED TERMS OF REFERENCE**

The purpose of these Terms of Reference is to provide guidance to the general public, the Transport Committee and PWD on eligibility for assistance for the construction of Advance Works to Camp Roads and Camp Link Roads, and how such assistance shall be administered.

1 Camp Roads - Routes and Completion Dates

The Transport Committee shall issue, through the Camp Roads consultant, on maps not smaller than 1:25,000, the proposed routes for each of the Camp Road sections viz:

Mount Pleasant - Goose Green
Goose Green - Newhaven
Port Howard - Chartres
Fox Bay - Chartres
Chartres - Hill Cove/Roy Cove
Fox Bay - Port Stephens
Darwin - San Carlos
San Carlos - Douglas
Douglas - Teal Inlet
Teal Inlet - Malo
Goose Green - North Arm

Together with these maps shall be the anticipated construction completion date at key points.

The purpose of this information is to enable farm communities and individual farms to be aware when any piece of road relevant to them will be completed and what its route will be.

2 Camp Roads - Advance Works

- a) **Self-Help Schemes:** A farmer for his own use, or a neighbouring farmer who regularly uses a track who has received the consent of the landowner, may apply for funds to upgrade a piece of Camp track, bridge, culvert or crossing on the proposed Camp Roads route in advance of the Camp Roads construction contractor provided that
- i) the works are not on a section for which a contract has already been let and the projected date for commencement of construction by the Camp Roads construction contractor on that stretch of track is more than eight months hence;
 - ii) there is a need, for purposes of free passage of freight and/or passengers, to upgrade that stretch of track, bridge, culvert or crossing;

- iii) the proposed works are designed by the Camp Roads consultant or PWD, or receive the prior approval of PWD.
 - iv) there will not be a need to rebuild or replace those works by the Camp Roads construction contractor when he arrives at that section of Camp Road;
 - v) the Transport Committee approves the application and recommends to PWD that funding be given;
 - vi) PWD approves the level of funding and is satisfied as to the proper use of funds;
 - vii) adequate funds are available from the Camp Roads budget;
 - viii) the Director of Public Works or any person nominated by him shall have free access to inspect the site of the proposed works, the works under construction and the completed works, without which access approval for payment of funds may not be given;
 - ix) the Director of Public Works shall certify that the works are satisfactorily completed prior to any payment being made;
 - x) proper use of funds shall be limited to direct materials, direct labour and rental of plant on a lump sum basis. No amounts shall be payable for overheads, indirect costs, travelling time or unauthorised cost overrun.
 - xi) no funds will be allocated to any works commenced prior to approval by the Transport Committee.
 - xii) any landowner granted public money for the upgrading of a track must agree to share its use with any affected neighbour.
- b) **Independent Contractors:** An independent contractor who has received the consent of the landowner may apply for funds to upgrade a piece of Camp track, bridge, culvert or crossing on the proposed Camp Roads route provided that
- i) all the conditions shall apply which apply in a) above, except for section x) the proper use of funds, which for independent contractors may also include overheads and indirect costs;
 - ii) the works shall be offered for competitive tender and PWD is satisfied that the level of funding is reasonable;

- iii) he shall have applied to the Transport Committee to be a registered independent contractor for Camp Roads;
- iv) he shall be a locally registered company or a resident.

3 Camp Link Roads

- a) **Self-Help Schemes:** A farmer for his own use, or a neighbouring farmer who is a regular user of a track who has received the consent of the landowner, may apply for funds to upgrade a piece of Camp track, bridge, culvert or crossing which is not on the proposed Camp Road route, but which will connect a recognised farm house or community to the proposed Camp Road route, provided that
 - i) there is a need, for the purposes of free passage of freight and/or passengers, to upgrade that stretch of track, bridge, culvert or crossing;
 - ii) the proposed works are, in the opinion of PWD, to a design and construction standard sufficient to withstand the normal usage of the track;
 - iii) the Transport Committee approves the application and recommends to PWD that funding be given;
 - iv) PWD approves the level of funding and is satisfied as to the proper use of funds;
 - v) adequate funds are available from the Camp Link Roads budget;
 - vi) the Director of Public Works or any person nominated by him shall have free access to inspect the site of the proposed works, the works under construction and the completed works, without which access approval for payment of funds may not be given;
 - vii) the Director of Public Works shall certify that the works are satisfactorily completed prior to any payment being made;
 - viii) proper use of funds shall be limited to direct materials, direct labour and rental of plant and machinery on a lump sum basis. No amount shall be payable for overheads, indirect costs, travelling time or unauthorised cost overruns;
 - ix) any landowner granted public money for the upgrading of a track must agree to share its use with any affected neighbour.

b) **Independent Contractors:** An independent contractor who has received the consent of the landowner may apply for funds to upgrade a piece of Camp track, bridge, culvert of crossing which is not on the proposed Camp Road route provided that:

- i) all the conditions shall apply which apply in a) above, except for section viii) the proper use of funds, which for independent contractors may also include overheads and indirect costs;
- ii) the works shall be offered for competitive tender and PWD is satisfied that the level of funding is reasonable;
- iii) he shall have applied to the Transport Committee to be a registered independent contractor for Camp roads;
- iv) he shall be a locally registered company, or a resident.

4 Applications

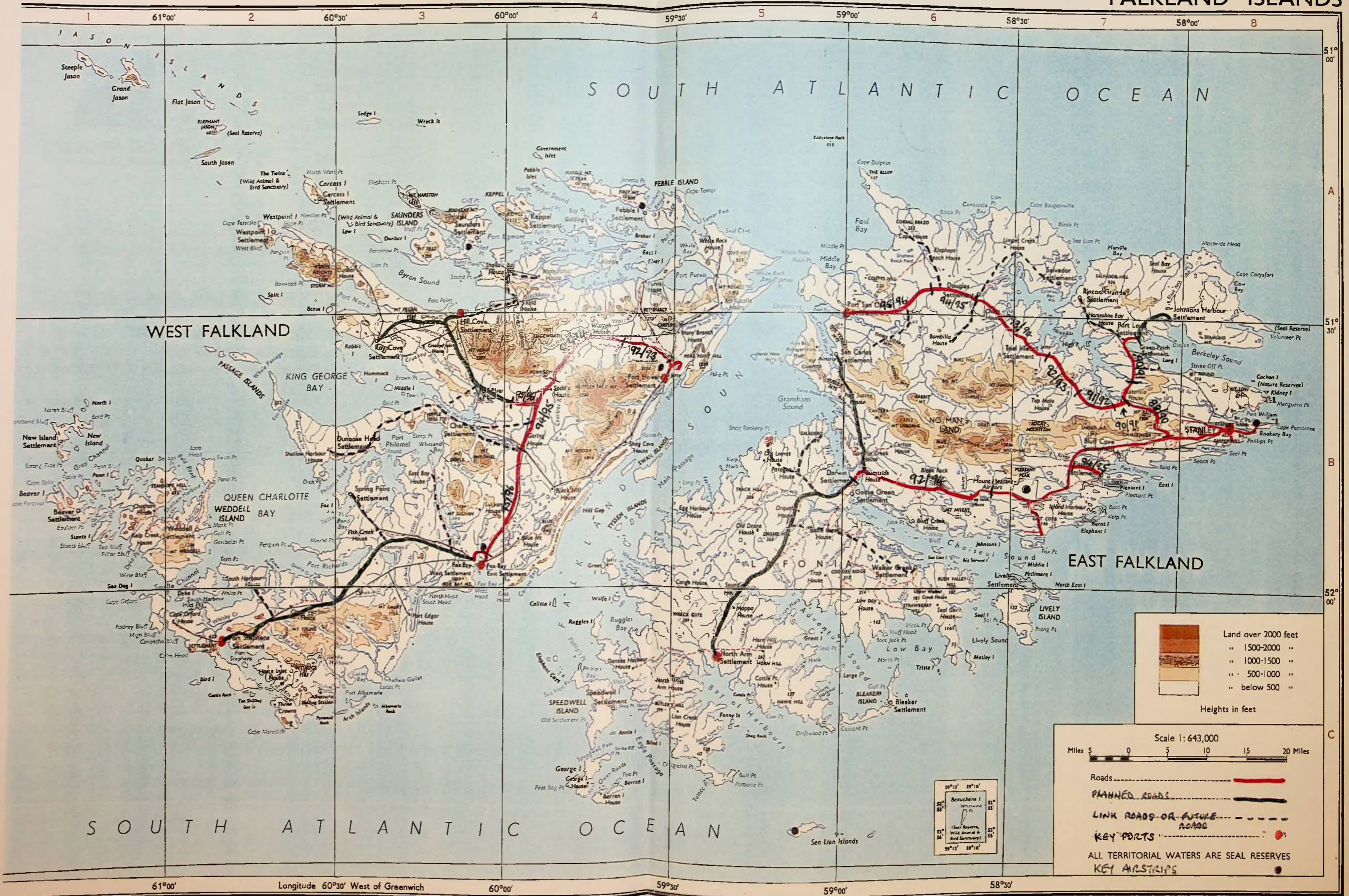
All applications to carry out works under either 2 or 3 above shall be made to the Director of Public Works, stating:

- i) the location of the works to be carried out;
- ii) the nature of the works including a sketch plan where appropriate;
- iii) an estimate of materials required for completion of the works;
- iv) an estimate of the labour and plant hire elements of the works;
- v) proposed commencement and completion dates.

An application for funds does not constitute any right to receive funds or to start work. The Director of Public Works will seek clarification where necessary and call for tenders if appropriate; he is the only officer empowered to give authority to commence work, commit funds or make payments.

Applicants should particularly note that works may be restricted by funds available and these Terms of Reference do not represent a commitment by FIG to provide funds.

FALKLAND ISLANDS





FALKLAND ISLANDS
DEVELOPMENT CORPORATION

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MEMO

To: Members of the Transport Advisory Committee	Date:
From: Hugh Normand - GM FIDC (Secretary to the TAC)	

EAST FALKLANDS LINK TRACK PRIORITIES

The sub-committee met to determine the priorities for the building of the camp tracks in the East Falkland. The tracks to be considered were to:

- Bombilla
- Brookfield
- Greenfield
- Johnson's Harbour
- Long Island
- Rincon Grande and Horseshoe Bay
- Salvador
- The Murrell &
- Volunteer Point

The committee considered the priorities in terms of:

1. The numbers of families living at each settlement - and therefore how many people would be expected to benefit from the track
2. The possibility of any winter working
3. The time it would take to build the track, - and therefore how quickly the benefit would be achieved.
4. The predicted future usage of the track
5. The current usage (so far as it is known)
6. The availability of alternative transport - the better the current alternative transport availability the lower the priority allocated to that track
7. The type of camp over which the track is to built - the more difficult camp being awarded the higher priority; and finally:
8. The requirement to move plant and the workers camp from one site to another.

The priority for each Settlement was considered with and without the impact of plant and worker's camp movement, as changing priorities inevitably also change the need to move plant and the workers camp.

Taking all these issues into consideration the sub-committee decided that the programme could be best achieved with four difference worker's camp sites.

Camp site number one would be used to build the road to:

1. Greenfield
2. Bombilla, and
3. The first part of the track to Salvador

The road camp would then move to site number two and build the track to:

4. Johnson's Harbour
5. Long Island
6. Rincon Grande and Horseshoe Bay, and
7. Brookfield

Camp number three would be used to build the second half of the track to:

8. Salvador

this could be done from Salvador settlement or from the road head, as considered most desirable by the engineers.

The camp would then be moved to the last site to build the road to:

9. Volunteer Point

There was some discussion as to whether a road should be built past Johnson's Harbour to Volunteer Point but such policy decisions were not within the terms of reference of the sub-committee. In any event, as it is number 9 and last on the list, there is time to debate the issue in the proper forum.

The road to **The Murrell** was not prioritised, as in the opinion of the Public Works Department, the road could be constructed during the winter months.

It is impossible to predict the exact time required to build each section of road, but the following timetable gives an indication of the likely programme:

Track Destination	Season	Camp
1. Greenfield	97/98	1
2. Bombilla		
3. Salvador 1	98/99	
4. Johnson's Harbour	99/00	2
5. Long Island		
6. Rincon Grande and Horseshoe Bay	00/01	
7. Brookfield		3
8. Salvador 2	01/02	
9. Volunteer Point	02/03	4

10. The Murrell link track should be planned to fit with other winter commitments.

H A Normand - GM-FIDC

8/4/97

