DEPARTMENT OF THE SENATE
PAPER NO. 489
3 MAY 1967
PRESENTED
J.R. Odgen
Clerk of the Senate

1967

THE PARLIAMENT OF THE COMMONWEALTH OF AUSTRALIA

PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS

REPORT

relating to the proposed construction of

BEEF ROADS

WESTERN BARKLY TABLELANDS, NORTHERN TERRITORY

CONTENTS

	Paragraph	
The Committee's Investigation	1.	
The Present Proposal	3	
Beef Roads	4	
Objectives	7	
Direction of Cattle Movement	9	
Sealing of Beef Roads	12	
Need for Beef Roads in the Western Barkly Tablelands		
Pastoral Industry	15	
The Mining Industry	22	
Tourist Industry	24	
Fishing Industry	26	
The Committee's Conclusions	27	
Construction of Proposed Roads		
Design *	29	
Drainage, Bridges, etc.	33	
Materials	36	
Daly Waters to Cape Crawford Road	37	
Anthony Lagoon to Borrolcola Road	41	
Anthony Lagoon to Barkly Highway	45	
Committee's Conclusion	49	
Design and Construction Programme	50	
Estimates of Cost	51	
Widths of Sealed Beef Roads	52	
Pagammandations and Conclusions	54	

PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS

WESTERN BARKLY TABLELANDS BEEF ROADS

REPORT

By resolution on 15th March, 1967, the House of Representatives referred to the Parliamentary Standing Committee on Public Works for investigation and report, the proposal to construct beef roads in the Western Barkly Tablelands of the Northern Territory.

The Committee have the honour to report as follows:

THE COMMITTEE'S INVESTIGATION

- 1. The Committee received submissions from the Northern Territory
 Administration and the Department of Works and took evidence from
 representatives of these organisations. We also took evidence from the
 General Manager of Mt. Isa Mines Ltd. Hearings were held in Canberra,
 and at MoArthur River in the Northern Territory.
- 2. We flew over the routes proposed for the Daly Waters to Cape Crawford and Borroloola to Anthony Lagoon roads and travelled over a short section of the existing pastoral road between Borroloola and McArthur River. We also inspected about 20 miles of the unsealed beef road between Anthony Lagoon and the Barkly Highway and a section of the recently completed sealed beef road between Katherine and Willeroo.

THE PRESENT PROPOSAL

- 3. The work in the present proposal is of three parts, viz.
 - (a) construction of a sealed beef road between Daly Waters and Cape Crawford. The new road will be 168 miles long and is estimated to cost \$3.4 million;
 - (b) construction of a sealed beef road between Borroloola and Anthony Lagoon through Cape Crawford. This road will be about 162 miles long and is estimated to cost \$5.2 million;

(c) sealing the existing gravel surfaced beef road which runs from Anthony Lagoon to the Barkly Highway through Brunette Downs. This read, which is 140 miles long, was built between 1962 and 1965. The sealing work is estimated to cost \$1.25 million.

BEEF ROADS

4. Since 1962 when approval was first given for the construction of beef roads in the Northern Territory, the following roads have been completed -

Alice Springs Area

Stuart Highway to Yuendumu - 168 miles of unsealed road.

Stuart Highway to Plenty River - 128 miles of unsealed road.

Tennant Creek Area

Anthony Lagoon to Barkly Highway - 140 miles of unsealed road.

Victoria River District

Dunmarra to Moolooloo - 135 miles of unsealed road.

Katherine to Willeroo - 75 miles of sealed road.

Timber Creek Junction to Western Australian border - 132 miles of unsealed road.

- 5. In addition, the Willoroo Top Springs road (105 miles) is almost completed to a sealed standard and construction is about to commence on the Top Springs Wave Hill road (100 miles), also with a sealed surface. The latter road was the subject of investigations and reports to Parliament by the Parliamentary Standing Committee on Public Works on 22nd September 1963 and 18th March 1965 respectively.
- 6. Approval to proceed with planning of the various works in the present reference as well as of the sealed beef roads from Mataranka to Roper Bar, and from Willeroo to Timber Creek Junction, was given by the Government late in 1966 when it considered a five to six year programme of beef roads development. It is understood that the reference to the Committee of the two latter projects will occur later.

- 7. Objectives The objectives of the beef roads scheme are, briefly, to provide pastoralists with improved access to outlets for cattle and to enable cattle to reach their destinations in better condition and at an earlier age than previously. The increased return to producers following the construction of the new roads is expected to result in more improvements being made to properties and stock and these will, in turn, result in the production of more and better cattle.
- 8. The works in the present reference, in particular, aim to bring about:
 - (a) increased export income through increased processing of cattle at export meatworks;
 - (b) broader integration of cattle production between Territory pastoral districts, e.g. store cattle from the Gulf will be fattened in Central Austrelia in good seasons, and on improved pastures in the Katherine district;
 - (c) greater drought management flexibility for the Alico Springs district, e.g. breeders from the Gulf and Tablelands could assist in re-stocking;
 - (d) immediate and long term economic development, through improved communications, principally in the pastoral industry but also in the mining, tourist and fishing industries in the Gulf and adjacent areas.
- 9. <u>Direction of Cattle Movement</u> Before work on the beef roads scheme commenced, it was traditional for most cattle turned off properties in northern areas of the Northern Territory to be walked to Queensland for disposal. This pattern changed significantly with the construction of the abattoirs at Katherine and Darwin and the implementation of the first phase of the beef roads scheme.
- 10. The present situation is that a majority of cattle in the more northerly areas affected by the proposed roads, now move by road train to the Katherine and Darwin areas, with the remainder still being turned

off through Queensland. The new roads are expected to result in some increase in the north-westerly flow and possibly additional movements to Gentral Australia.

- 11. Cattle from the southern areas mainly move to Queensland with a consequential loss of time, weight and quality. The Committee were told that the proposed roads are expected to attract more of these cattle to the Katherine and Darwin abattoirs and so increase returns to producers through lower killing costs than at present. The potential loss to Queensland meatworks of cattle expected to be now diverted to the Territory abattoirs is not thought to be significant.
- 12. <u>Sealing of Beef Roads</u> Until the previous Public Works
 Committee had investigated the Top Springs Wave Hill proposal, all
 beef roads in the Northern Territory had been finished with gravel
 surfaces only. In the examination of the Top Springs Wave Hill
 proposal, the Committee closely studied the benefits flowing from
 the bitumen sealing of beef roads and recommended that in that
 instance the road should be sealed.
- 13. Since then the Katherine Willeroo road has been completed and the Willeroo Top Springs road is now almost completed, each with a sealed surface. The Committee's recommendation on the Top Springs Wave Hill road has been accepted by the Government and this road also is to be sealed. The Committee were pleased to note that the new roads in the present reference are to be sealed and that the existing Anthony Lagoon Barkly Highway beef road is to be improved by sealing.
- 14. Apart from the direct saving in the cost of maintenance, the advantages of sealing beef roads are, briefly:
 - (a) a saving in transport costs through lower operating costs;
 - (b) avoidance of the dust asphyxiation problem for cattle travelling in road transports; and
 - (c) minimising other causes of cattle losses in transit, principally through bruising and horning.

In addition, sealed roads improve the possibilities of year-round access to properties.

NEED FOR BEEF ROADS IN THE WESTERN BARKLY TABLELANDS

- 15. <u>Pastoral Industry</u> The proposed roads will serve the Gulf region of the Darwin and Gulf District and the western region of the Barkly Tablelands District. These are two distinct pastoral regions separated by an escarpment running east and west through Mallapunyah Station.
- 16. From a pastoral point of view, the quality of the Gulf region varies considerably but it is generally, relatively poor country. Noar the coast the terrain is low lying with extensive stretches of mud and salt flats. It is not fattening country but it is an area which will produce store cattle in reasonable numbers. The country is well wetered but at present the land is largely undeveloped.
- 17. The properties in the area expected to benefit from the construction of the proposed roads include seven with a total area of about 12,250 square miles west of the Mearthur River and eight covering 11,850 square miles east of the river. Most of these properties are virtually unimproved and until recently many were held under grazing liconce. To provide a form of security which would encourage development, about three years ago the licensees were granted 50 year pastoral leases. Simultaneously, a new outlet for cattle became available through the new abattoirs at Katherine and Darwin. The possible establishment of a mining township at Mearthur River could provide a further stimulus to local production.
- 18. The present cattle population of 28,600 provides an annual turn-off of some 4,200 head valued at about \$170,000. The Committee were told that these figures are capable of growing to 32,000, 6,300 and \$315,000 respectively in the short term and to 125,000, 20,000 and \$1 million respectively in the long term, with the completion of the reads in this reference and the implementation of capital improvements and better management that are expected to follow.

- 19. The black soil plains of the western region of the Barkly
 Tablelands District are good pastoral country capable of turning off
 fat cattle in a normal season as well as some store cattle. The
 main difficulty is the scarcity of surface water and the danger of an
 occasional severe drought.
- 20. The soven properties in the area which will benefit from the construction of the roads in this reference have a total area of 18,000 square miles. Several other properties in the more southerly parts of the area could also use the roads for the transport of fat cattle, particularly when prices are more favourable in the Northern Territory than in Queensland, which is their present outlet.
- 21. The prospect for increased production in the region is good but not quite as good, relatively, as in the Gulf region because of the present higher standards of development and management of properties. From the present cattle population of 140,000, the annual turn-off of 22,000 head is valued at \$1.32 million. In the short term this turn-off might be expected to grow to 28,000 head valued at \$1.82 million whilst in the long term the cattle population could reach 162,000, with a turn-off of 35,000 head valued at \$2.9 million.
- 22. The Mining Industry

 The Committee noted that Mt. Isa Mines
 Ltd. is engaged in prospecting a large low grade zinc/lead/silver
 deposit near the McArthur River station homestead. The deposit is
 about 1½ miles from the proposed beef road to Borroloola. The
 company has already spent over 33 million on exploration, equipment
 and buildings, including a small settlement and with the Northern
 Territory Administration has undertaken investigations of port,
 railway, township and water storage facilities. The capital investment required for full scale operations could exceed \$100 million.
- 23. The availability of reliable road links to Darwin via
 Daly Waters and to Mt. Isa through Anthony Lagoon would greatly assist
 development at McArthur River and would serve as the inland surface

access to the area when mining operations commence. The roads would also assist other companies and individuals in the continuing prospecting and drilling in the general area.

- 24. <u>Tourist Industry</u> The Committee were told that direct and indirect spending by tourists in the Northern Territory is at present running at about \$13 million per annum and that on this basis tourism is next to the pastoral and mining industries in economic importance in the Territory. The number of tourists attracted to the Territory has more than doubled in the last 10 years and this trend is expected to continue.
- 25. The completion of the beef roads in the present reference will enable bus tour operators and private car users to plan more extensive, interesting and varied tours, including the Gulf country which has a mild and comfortable climate for a major part of the year, the McArthur River area, the off shore islands and Borroloola, the history of which has some tourist appeal.
- 26. <u>Fishing Industry</u> The potential of the fishing industry in the waters of the Gulf of Carpenteria, particularly prawns, is thought to be considerable. We were told of the interest that has been shown in the possibility of establishing a prawn processing industry in the western gulf area in the vicinity of Port McArthur. The provision of an all-weather road access to the area would greatly assist the establishment of a fishing industry.
- 27. The Committee's Conclusions Quite apart from the general considerations of national development, it was demonstrated to the Committee's satisfaction that there is already economic justification for the development of a beef roads system in the Western Barkly Tablelands area of the Northern Territory. It is evident that the proposed roads will be of both immediate and long term benefit to the cattle industry and might be expected to play a significant part in developing the full potential of the mining, tourist and fishing industries.

28. Furthermore, we believe that to derive full benefit from the proposed works, the proposed Daly Waters to Cape Crawford, and Borrolcola to Anthony Lagoon beef roads, should both be finished with sealed bitumen surfaces and the existing beef road between Anthony Lagoon and the Barkly Highway should also be bitumen sealed.

CONSTRUCTION OF PROPOSED ROADS

- 29. <u>Design</u> In conformity with the practice followed on other beef roads in the Northern Territory, Queensland and Western Australia, the roads in this reference will be designed to carry cattle transports and other vehicles conforming to permitted weight and dimensional requirements. Roads will be designed to be generally trafficable at all times except for short periods when the depth of water at the floodways makes the road impassable. Alignments will be designed for traffic speeds of 60 mph with large radius curves and gentle grades, except where these standards cannot be economically provided, such as in short hilly sections. Designs will conform to the guides and policies recommended for rural roads by the National Association of Australian State Road Authorities.
- 30. The new beef roads will generally follow the routes of existing pastoral roads but there will be deviations where improved alignments and drainage conditions are essential. Temporary side tracks will be provided where necessary to minimise interruption to traffic during construction.
- 31. Road formations, including the pavement and road shoulders, will have a usable surface of not less than 26 feet. At least 18 feet of this width will be a compacted gravel pavement, the thickness of which will vary between 6" and 9" depending on the strength of the underlying ground. The central 12 feet of the gravel pavement will have a bitumen surface comprising a prime coat and a single application of bitumen and screenings.

- 32. The road formation will generally be raised 6 to 12 inches above natural ground level to prevent water logging. In flood plains and low lying areas, the formation height may exceed 12 inches as considered necessary. The formation material will consist of local soil compacted and graded to shape. Roadside parking areas, gravelled where necessary, will be provided at intervals of about 10 miles.
- 23. <u>Prainage, Bridges, etc.</u> Permanent drainage structures will be provided in the form of inverts, culverts, causeways and bridges, depending on local drainage conditions. As the country generally is drained by channels meandering across wide flood plains, it is not economical to provide, in all cases, drainage structures above maximum flood level. Designs will therefore permit occasional flooding of drainage structures and the road approaches. This flooding is not expected to delay traffic for more than a few days at a time in a normal year, except at major river crossings where, under exceptional conditions, delays may be somewhat longer.
- 34. Bridges will be fixed at about the level of the flood plain and they will be submersible. The deck will be 14 feet wide for single lane operation. Construction will generally be with precast, prestressed concrete deck units supported on piled sub-structures. Stream crossings not involving approaches, will be generally of two lane width.
- 35. As a result of experience gained in the construction and maintenance of existing beef roads, it is proposed to provide more extensive flood protection measures than hitherto on bridge abutments, causeways and culverts, and possibly to increase the number of bridges so that drainage structures will be less liable to damage.
- 36. Materials Sufficient deposits of naturally occurring gravel suitable for the construction of roads are expected to be available within 15 miles along the roads. Sources of good quality stone for use as crushed aggregate in the bitumen surfacing are also

available within reasonable distances. Water for construction purposes will be provided from natural water holes and streams where available and also from earth dams and underground bores.

- 37. <u>Paly Waters to Cape Crawford Road</u> This road, about 168 miles long, will commence at the Stuart Highway just south of Daly Waters and terminate at the Cape Crawford junction on the proposed Anthony Lagoon Borrolcola road about 230 miles north of the Barkly Highway. The existing pastoral road is only a graded track with some gravel sheeting in parts. In the flat and undulating sections it is trafficable at reasonable speeds during the dry season but during the wet it becomes almost impassable.
- 38. Investigations have shown that the best route for the new road is on the alignment of the existing pastoral road. This route generally follows the high watershed between the Barkly Tableland to the south and the Roper River valley system to the north. Several deviations, totalling about 25 miles, are proposed and the existing road will be straightened and curves improved where necessary. For the first 100 miles the road will be constructed on flat elevated plateau country involving only minor earth works. No large streams are encountered and flood inverts will be used, as a rule, to pass the water across the road in shallow flows.
- 39. Of the remaining 70 miles, about 25 miles is in hilly to rough country, the balance being either flat or gently undulating. The rougher section will involve some heavier earth works and more extensive use of culverts and causeways for drainage purposes. Two bridges are proposed.
- A0. Naturally occurring surface water between Daly Waters and Cape Crawford is scarce and water for construction purposes is to be obtained from hores and dams constructed at intervals along the road.

- All. Anthony Lagoon to Borrolcola Road This road will be about 162 miles in length commencing at Anthony Lagoon, passing through the Cape Crawford junction and terminating at Borrolcola, about 302 miles from the Barkly Highway. The existing pastoral road is a formed natural gravel road between Anthony Lagoon and Mallapunyah and a graded track from there to Cape Crawford and Borrolcola. Sections are almost impassable in the wet season and in parts four-wheel drive vehicles are required in the dry. The average rainfall of the area varies from 15 to 30 inches, occurring mainly in the wet season.
- 42. The Committee were told that the route for the road has been chosen after examination of aerial photographs and ground reconnaissance. It will follow natural gravel ridges, where possible, to minimise construction costs, but several deviations from the existing pastoral road alignment are proposed.
- 43. About 65 miles of the road will cross black soil areas involving light to medium earth works with formations at least 12 inches above natural ground level. On the remaining 97 miles, some hilly sections will require heavier earth works but the soil conditions are generally better for road building. Nine bridges, as well as culverts, causeways and other drainage works are proposed.
- 44. Water will be available from existing bores and water holes, some of which have permanent water available.
- Anthony Lagoon to Barkly Highway

 The existing beef road
 was constructed between 1962 and 1965 with an unsealed gravel surface.

 About 80 of the 140 miles of the road were built in black soil
 country where the pavement consists of imported gravel compacted to
 a 7" thickness. The remaining 60 miles were constructed in limestone
 and laterite country and the existing pavement consists of either
 compacted sand clay or natural laterite gravel. Overall, the
 terrain is flat with some slightly undulating sections. The alignment and grades conform with the standards currently proposed for
 new beef roads.

- 46. Under traffic, and particularly during the dry season, the gravelled sections of road have loosened and corrugated and some of the gravel has already been lost. This will have to be replaced before the road is scaled. The cost of restoration will depend on the condition and thickness of gravel remaining when the scaling work actually commences. We were told that if the road is not scaled, gravelled sections would require reshecting every four or five years.
- 47. The sections of road paved with local sand clay material have also deteriorated under traffic, particularly during the wet season, to such an extent that gravel sheeting of about 50 miles prior to sealing is now required to provide the necessary shape correction and strengthening.
- 48. The sealing to be applied will consist of a prime coat and a single application of bitumen and screenings.
- 49. <u>Committee's Conclusion</u> The Committee recommend the construction of the works in this reference.

DESIGN AND CONSTRUCTION PROGRAMME

50. The Committee were told that subject to an early approval to proceed being obtained, construction is to be phased in the following way.

Daly Waters to Cape Crawford:

Design and documentation require six months to complete. It is therefore possible for construction to commence in the second half of 1967. The work is estimated to take 30 months to complete, i.e. completion late in 1969 or early 1970.

Anthony Lagoon to Borroloola:

Design and documentation require 12 months and construction $3\frac{1}{8}$ years. The work is thus expected to be completed towards the end of 1971.

Barkly Highway to Anthony Lagoon:

Little design and documentation is required and construction is expected to take 12 months. The work can therefore be completed by the end of 1968.

ESTIMATES OF COST

51. The estimated cost of the works when referred to the Committee was \$9.85 million as follows:

Daly Waters - Cape Crawford Junction	\$	\$
- Earthworks and formation	200,000	Ψ
- Drainage	300,000	
- Gravel pavements	1,700,000	
- Bitumen sealing	900,000	
 Miscellaneous items, including temporary side tracks, sign and guide posting, cattle grids, water supply, camp establishment 	300,000	3,400,000
Anthony Lagoon - Borroloola		
- Earthworks and formation	700,000	
- Drainage	1,350,000	
- Gravel pavements	1,850,000	
- Bitumen sealing	850,000	
 Miscellaneous items, including temporary side tracks, sign and guide posting, cattle grids, water supply, camp establishment 	450,000	5,200,000
Anthony Lagoon - Barkly Highway		
- Restoration of gravel pavements	350,000	
- Restoration and gravelling sand clay pavements	300,000	
- Bitumen surfacing	600,000	1,250,000
		\$9,850,000
- Restoration and gravelling sand clay pavements	300,000	

WIDTHS OF SEALED BEEF ROADS

- 52. The Committee took the opportunity during the present inquiry
 to look into the matter of the deterioration of the shoulders of sealed
 12 ft. beef roads due to climatic factors and vehicles passing each
 other. We also received information about maintenance and reconstruction costs.
- 53. In the light of this information and the extensive network of existing and proposed beef roads, we believe that some long term investigations should be undertaken into the capital maintenance and reconstruction costs of beef roads of various widths. For example,

we suggest that sections of one of the more frequently used beef roads should be constructed to an 18 ft. width and costs over a period analysed in the way suggested. The same sort of inquiry might also be made into the bitumen priming of the shoulders of a 12 ft. beef road and other shoulder protection methods.

RECOMMENDATIONS AND CONCLUSIONS

54. The summary of recommendations and conclusions of the Committee is set out below. Alongside each is shown the paragraph in the report to which it refers.

Paragraph

1. There is already economic justification for the development of a beef roads system in the Western Barkly Tablelands area of the Northern Territory 27 2. The proposed Daly Waters to Cape Crawford and Borrolcola to Anthony Lagoon beef roads should both be finished with sealed bitumen surfaces. 28 3. The existing beef road between Anthony Lagoon and the Barkly Highway should be bitumen sealed. 28 4. The Committee recommend the construction of the works in this reference. 49 5. The estimated cost of the works, when referred to the Committee, was \$9.85 million. 51 6. Long term investigations should be undertaken into the capital maintenance and reconstruction costs of beef

F. C. CHANEY
Chairmen

53

Parliamentary Standing Committee on Public Works, Parliament House, CANBERRA A.C.T.

roads of various widths.