# Chapter 6

# Transport



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# Chapter 6 Transport

This chapter provides key characteristics of the transport system in Northern Australia, focusing on exports and imports via sea ports and coastal shipping, illustrating their sizes and growth rates; basic sea ports features; air passenger transport; railways and their main transport tasks; road transport; and the main technical characteristics of roads. Wherever possible, Northern Australia's transport characteristics are compared with those of Australia. Aggregations of sea transport data by subregions, ports and SLA is provided on CD and in the Internet version of the compendium.

In 2007–08, exports via Northern Australian ports grew faster than the total tonnage of Australia's exports and represented 56.3 per cent of total tonnage of Australian exports via sea ports.

The Pilbara Region in Western Australia was the largest source of tonnage exported from Northern Australia, followed by the Mackay and Gladstone regions of Queensland.

Import tonnages via Northern Australian ports are only a small fraction of those exported via these ports, with Darwin-East Arnhem in the Northern Territory and the Northern Region of Queensland being the largest importing regions in Northern Australia.

The value of exports via maritime ports of Northern Australia represented 21.1 per cent of the Australian total value in 2007–08; the Pilbara Region was the largest source of export value with iron ore exports worth nearly \$30 billion in that year.

Coastal shipping originating in Northern Australia represented 20 per cent of the Australian total tonnage loaded in 2006–07 and 14.3 per cent of the total unloaded tonnage in Australia.

Regular passenger transport, charter and other aviation services are used relatively more frequently in Northern Australia than in the rest of Australia due to large distances and specific employment practices, such as 'fly-in, fly-out' staff rotation. Residents of Northern Australia fly more frequently to other domestic destinations than Australians living outside of this region.

Domestic aviation uses more capacity per capita, as measured by aircraft movements, to service relatively sparsely populated and distant destinations in Northern Australia than in the rest of the country.

A large and important role is played by charter and owner-operated general aviation in provision of specialised aerial passenger and air freight services to that region, however, information on these services is not being collected and published in a systematic way.

Railways in the Pilbara Region of Western Australia are not interconnected with the rest of the continent and carry very large tonnages of iron ore for exports via sea ports. Standard gauge railways of the Northern Territory and Queensland's Northern

Region are interconnected with the southern states and carry coal and other commodities for exports via ports.

The unsealed road network in Northern Australia is linked to the rest of Australia via sealed and mostly all-season roads.

Northern Australia's maritime, rail, road and aviation transport systems are vital parts of the Australian exports of goods and domestic supply networks. A stylised Map 6.1 illustrates major flows of goods by sea transport, rail freight and road haulage. There are three major flows of commodities which dominate the transport systems in Northern Australia: rail transport of iron ore to ports for loading on ships in the Western Australian Pilbara Region (largely for exports); exports of coal transported by rail from southern regions of Queensland and loaded for exports mainly in Queensland's MacKay Region; and bauxite shipments by coastal freight from Weipa in Queensland's Far North Region for processing in Gladstone (see Map 6.1.1).



#### Map 6.1.1 Northern Australia – Australia's major freight flow, 2006–07

Source: BITRE (2009), unpublished data.

## 6.1 Trade via sea ports

## Exports via sea ports of Northern Australia—export tonnage

Tonnage exported via the sea ports of Northern Australia represented 56.3 per cent of the total tonnage exported from Australia via sea ports in 2007–08. Major sea ports in Northern Australia are located on the mainland but operations are also conducted from small islands and oil and gas production rigs, as illustrated on the Map 6.1.2 below. The Pilbara Region was the dominating single largest source of tonnage (iron ore) representing 34.6 per cent of the total Australian export tonnage via maritime ports. In addition to the tonnage reported, there was a volume of LNG exported to foreign markets from the North West shelf of Western Australia. For reasons of commercial confidentiality information on LNG exported is not available and therefore not listed in Table 6.1.1.



Note: Jabiru at the Timor Sea is a gas/oil venture. Source: Geoscience Australia (2009), unpublished.

The Mackay and Gladstone regions experienced the fastest growth of export of coal, minerals and food commodities via sea ports (see Figure 6.1.1). Darwin-East Arnhem Region is the largest source of export tonnage in the Northern Territory, followed by confidential Northern Territory ports, and rigs and off shore terminals which export gas and oil from off-shore resources.



# Figure 6.1.1 Northern Australia – export tonnage via sea ports, by region, 1996–97 to 2007–08 (millions of tonnes)

Note: Gladstone/Rockhampton ports are major hubs for bauxite and alumina operations sourced in Northern Australia; beginning from 2006–07, these ports are under a joint management and report activities in Gladstone and Rockhampton as one port.

The share of Northern Australia in shipping export commodities is illustrated in Figure 6.1.2. Tonnage exported from the Darwin-East Arnhem Region was relatively small but included energy commodities which grew strongly, especially in 2006–07 and 2007–08.

Source: BITRE (2009), unpublished data.

Region		1 996–97	1997–98	1998–99	00-6661	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006–07	2007–08 P	Per cent of Australia's exports via sea orts, 2007–08
Vorthern A	ustralia (WA)	164 867.9	171 084.1	165 712.2	183 074.6	195 301.1	195 214.8	221 388.3	231 358.1	266 999.9	277 125.3	295 400.5	331 233.7	36.0
Pilbara	Region	164 595.4	170 414.3	165 041.2	178 868.8	187 522.7	190 195.8	217 559.2	229 121.3	263 258.3	271 173.8	286 375.7	318 036.4	34.6
Kimbe	rley Region	272.4	669.8	671.1	4 205.9	7 778.4	5 019.0	3 829.1	2 236.2	I 537.9	I 460.4	1 727.7	4 430.6	0.5
WA offshor	e terminals.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2 563.0	5 692.7	7 013.0	0.8
WA ports (	islands)	0.0	0.0	0.0	0:0	0.0	0:0	0.0	0.6	2 203.7	I 928.2	I 604.4	I 753.8	0.2
Vestern Au	istralia state total	228 779.4	243 689.0	238 467.1	258 533.5	266 046.8	264 417.3	293 121.6	313 075.0	353 464.5	364 963.3	378 387.1	413 497.5	45.0
Vorthern r state total	egions as a per cent of WA	72.1	70.2	69.5	70.8	73.4	73.8	75.5	73.9	75.5	75.9	78.1	80.1	
Northern A	ustralia (NT)	7 273.9	6 498.6	6 284.8	5 808.7	5 519.2	5 012.0	5 371.7	5 934.8	6 241.9	8 112.5	13 882.4	15 150.3	1.6
Darwir	1–East Arnhem Region	2 520.9	I 573.3	1 246.9	705.3	574.6	454.0	448.I	593.9	456.7	2 152.3	7 640.8	8 962.8	0.1
Confidentia	lised NT ports	4 615.6	4 771.8	4 668.4	4 785.0	4 583.1	4 188.1	4 539.0	5 074.4	5 303.4	4 965.7	4 877.2	5 319.8	0.6
Rigs and off	shore terminals NT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	614.4	963.5	497.0	0.1
VT ports (i	sland)	137.4	153.5	369.5	318.4	361.5	369.8	384.6	266.4	481.9	380.1	400.9	370.7	0.0
Vorthern T	erritory total	7 273.9	6 498.6	6 284.8	5 808.7	5 519.2	5 012.0	5 371.7	5 934.8	6 241.9	8 112.5	13 882.4	15 150.3	1.6
Vorthern r otal	egions as a per cent of NT	0.001	100.0	0.001	0.001	0.001	0.001	100.0	0.001	0.001	100.0	100.0	100.0	
Vorthern A	ustralia (QLD)	95 467.7	103 586.7	110 985.3	122 290.2	137 191.9	139 514.5	147 400.8	153 964.3	163 508.2	160 177.8	170 774.9	171 448.8	18.7
Macka)	r Region	53 347.0	59 598.1	64 932.4	73 295.9	80 505.6	82 372.5	88 124.7	90 633.3	99 778.9	94 631.5	98 708.5	93 800.6	10.2
North	ern Region	6 018.0	6 646.9	7 238.3	7 136.7	8 775.4	7 594.6	7 998.0	8 065.2	8 605.7	7 792.8	7 124.0	7 515.7	0.8
Far Nc	rth Region	9 264.4	8 810.4	8 649.9	9 450.5	8 560.1	8 542.3	9 384.1	9 756.7	7 369.8	7 144.0	7 921.2	10 874.2	1.2
North	West Region	22.5	11.2	8.3	223.2	738.9	893.0	944.6	843.2	730.3	736.3	567.4	675.9	0.1
Sockhampt	on region	42.4	79.0	25.5	66.6	92.7	58.8	80.0	42.8	7.9	0.I	0.0	0.0	0.0
Gladstone r	egion	26 773.3	28 441.2	30 130.9	32 117.4	38 519.2	40 053.4	40 869.3	44 623.1	46 203.9	48 527.8	54 662.7	56 775.7	6.2
<b>2LD</b> ports	(islands)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	811.7	I 344.4	1.791.1	I 806.7	0.2
Queenslanc	state total	120 593.9	126 879.2	134 218.4	148 251.2	164 135.2	168 428.3	174 334.9	179 333.2	191 451.5	190 480.5	198 623.7	204 388.9	22.2
Vorthern r tate total	egions as a per cent of QLD	79.2	81.6	82.7	82.5	83.6	82.8	84.6	85.9	85.4	84. I	86.0	83.9	
Vorthern A	ustralia subtotal	267 609.4	281 169.4	282 982.3	311 173.6	338 012.2	339 741.3	374 160.8	391 257.3	436 750.0	445 415.7	480 057.8	517 832.7	56.3
Australia to	tal	569 196.5	606 199.4	610 846.5	645 556.4	685 240.7	695 065.8	716 507.8	756 934.2	813 277.6	837 148.6	856 456.7	919 005.5	100.0
Vote: Source:	Export tonnages of LPG fr BITRE (2009). unpublished	om the Nor data.	th West Re	gion Shelf aı	re not publi	shed by ABS	o for reason	is of confide	entiality.					

Northern Australia – exports via sea ports, 1996–97 to 2007–08 (thousand tonnes) Table 6.1.1

Source: Note: 133

Chapter 6 | Transport



# Figure 6.1.2 Northern Australia – export tonnage via sea ports, by state, 1996–97 to 2007–08 (million tonnes)

The value of Northern Australia's exports via sea ports was 21.1 per cent of the corresponding total Australian exports in 2007–08. Export values from all states and regions grew during the period 1996–97 to 2007–08. The Pilbara Region was again the single largest export earner, followed by Queensland's Northern and Mackay regions (see Table 6.1.2). Annual growth of value of these exports was strong between 1996–97 and 2007–08. For example, tonnage of exports from the Pilbara Region exports doubled in that period but the corresponding export values increased nearly five times. This was due to sustainable demand for commodities which resulted in faster rises of minerals and energy prices than their respective tonnages of exports during the reported period.

Source: BITRE (2009), unpublished data.

Table 6.1.2 Northern	Austral	ia—exp	orts via	sea por	ts by re	gion, 19	96-97 to	0 2007-	08 (\$ mi	illions)			
Region	1996–97	1997–98	1 998–99	00-6661	2000-01	2001-02	2002-03	2003–04	2004–05	2005–06	2006–07	2007–08	Per cent of Australia's export value via ports in 2007–08
Northern Australia (WA)	6 848.3	7 727.6	7 619.4	11 522.2	16 521.2	14 591.9	14 941.4	12 558.7	17 755.2	23 694.7	28 577.9	36 045.0	10.2
Pilbara Region	6 722.8	7 586.9	7 414.3	10 104.3	13 414.2	12 883.9	13 508.4	II 839.2	16 861.3	21 482.0	24 326.5	29 894.6	8.5
Kimberley Region	125.5	140.6	205.1	1 417.9	3 106.9	1 708.0	I 433.0	719.0	699.1	391.1	497.5	659.6	0.2
WA offshore terminals	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1 686.6	3 721.7	5 453.5	1.5
WA ports (islands)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	194.8	135.1	32.2	37.5	0.0
Western Australia state total	35 192.5	39 085.1	38 352.3	47 104.6	57 993.6	54 478.5	56 411.9	56 926.0	66 585.3	75 885.8	96 185.9	99 251.1	28.2
Share of NA (WA) in Northern Australia subtotal	34.7	34.1	34.4	43.7	46.1	41.4	44.2	41.2	42.5	40.2	43.1	48.6	
Northern Australia (NT)	2 214.6	2 001.9	I 813.3	I 966.3	2 263.2	2 372.6	2 209.7	2 392.1	2 840.1	3 695.1	6 502.8	6 723.6	1.9
Darwin-East Arnhem Region	I 692.8	I 459.6	1 081.9	1 218.2	1 418.4	I 555.2	I 430.5	I 592.8	1717.2	2 105.7	4 396.8	4 324.2	1.2
Confidentialised NT ports	486.5	484.1	595.5	623.6	712.2	703.9	693.9	732.4	961.1	897.6	1 068.1	1 661.8	0.5
Rigs and offshore terminals NT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	440.2	678.0	439.7	0.1
NT ports (island)	35.3	58.2	135.9	124.5	132.6	113.5	85.3	66.9	161.8	251.6	359.9	297.9	0.1
Northern Territory total	2 214.6	2 001.9	I 813.3	I 966.3	2 263.2	2 372.6	2 209.7	2 392.1	2 840.1	3 716.6	6 502.8	6 723.6	1.9
Share of NA (NT) in Northern Australia subtotal	11.2	8.8	8.2	7.5	6.3	6.7	6.5	7.9	6.8	6.3	9.8	9.1	
Northern Australia (QLD)	10 674.2	12 915.5	12 696.1	12 897.3	17 090.5	18 282.9	16 669.7	15 505.2	21 200.4	31 595.9	31 301.6	31 367.9	8.9
Mackay Region	3 490.4	4 336.4	4 218.5	3 942.4	5 112.3	6 397.9	6 044.0	5 265.9	8 676.0	12 790.9	11 667.2	10 886.5	3.1
Northern Region	3 301.7	4 112.1	4 297.2	4 665.9	6 145.1	5 715.6	5 137.3	4 921.9	6 177.9	8 956.6	10 394.4	11 294.4	3.2
Far North Region	I 324.6	1311.9	1 081.5	I 040.7	1 237.3	I 466.7	I 357.4	1 293.7	1 205.5	629.2	I 585.6	1 424.7	0.4
North West Region	35.4	15.3	9.4	135.9	388.2	365.0	362.9	364.9	369.4	710.4	877.8	696.6	0.2
Rockhampton region	30.2	87.0	11.9	73.7	133.0	112.0	82.0	68.4	14.0	0.6	0.0	0.0	0.0
Gladstone region	2 455.5	3 030.9	3 077.7	2 987.8	4 011.5	4 155.1	3 640.5	3 551.1	4 684.9	7 440.6	6 685.6	6 971.0	2.0
QLD ports (islands)	36.4	22.0	0.0	50.8	63.1	70.7	45.6	39.3	72.7	67.6	91.0	94.7	0.0
Queensland state total	24 705.7	28 217.9	28 630.0	31 005.8	39 280.9	41 712.9	38 937.5	38 350.3	47 254.2	59 369.3	62 407.3	62 056.0	17.6
Share of NA (QLD) in Northern Australia subtotal	54.1	57.0	57.4	48.9	47.6	51.9	49.3	50.9	50.7	53.6	47.2	42.3	
Northern Australia subtotal	19 737.1	22 645.0	22 128.9	26 385.8	35 874.8	35 247.4	33 820.8	30 456.0	41 795.7	58 985.7	66 382.3	74 136.6	21.1
Australia total	175 386.7	192 100.6	185 844.1	211 706.1	263 604.2	261 902.4	246 796.9	236 450.0	266 538.0	303 389.1	340 499.4	352 067.1	100.0

BITRE (2009), unpublished data. Source:

Chapter 6 | Transport

Figure 6.1.3 illustrates the fast growing exports via sea ports from Northern Australia, total of Australia. While the total value of Australia's exports via sea ports doubled between 1996–97 and 2007–08, the respective value of Northern Australia's export increased 3.5 times.





Western Australia's Pilbara and Kimberley regions were the regions with strongest growth of export value, followed by Northern Territory and Queensland (see Figure 6.1.4). There was an apparent weakening of growth of exports value following the 2001–02 cyclical downturn in demand but prices and demand recovered in 2003–04.

Growth in the value of exports via sea ports by region was strong but also volatile. In Figures 6.1.5, the peaking and then decline of the value of exports from the Kimberley Region was caused by exports of mineral fuels through the sea ports of that region between 1998–99 and 2006–07. This volatility partially reflects the life cycle of minerals projects with an initial rapid growth of exploitation, followed by stabilisation and a decline of activity. It also reflects fluctuation of commodity prices over that period and variability of exported volumes.

Similarly, in the Northern Territory, variability of value of exports via various sea ports is large and related to various minerals exports operations on islands, rigs and offshore terminals. While the Darwin-East Arnhem Region's value of exports increased by 2.5 times between 1996–97 and 2007–08, its various components increased or declined more dynamically during the same period (see Figure 6.1.6).

Source: BITRE (2009), unpublished data.



Figure 6.1.4 Northern Australia—value of exports via sea ports, 1996–97 to 2007–08 (index 1996–97 = 100)

Figure 6.1.5Northern Australia (Western Australia) – value of exports via sea<br/>ports, by region, 1996–97 to 2007–08 (index 1996–97 = 100)



Source: BITRE (2009), unpublished data.



# Figure 6.1.6 Northern Australia (Northern Territory)—value of exports via sea ports, by region, 1996–97 to 2007–08 (index 1996–97 = 100)

Source: BITRE (2009), unpublished data.

An even more dynamic value of exports via seaports of northern Queensland regions is illustrated in Figures 6.1.7 and 6.1.8. The value of exports of bauxite from the North West Region contributed to a 25 times increase in the value of exports from that region between 1998–99 and 2006–07, and then declined in 2007–08.





The value of exports via other Queensland's ports of the Mackay, Northern and Gladstone regions increased by about three times between 1996–97 and 2007–08 due to a large component of coal and alumina in exports, which noted significant increases in volume of exports and export prices. Export values via sea ports from the Far North Region stayed at around their 1996–97 levels.





Source: BITRE (2009), unpublished data.

## Import via sea ports of Northern Australia—import tonnage

Import tonnages via Northern Australia's maritime ports represented only 8.5 per cent of the corresponding Australian total in 2007–08, with Darwin-East Arnhem in the Northern Territory and the Northern Region in Queensland being the largest import receivers. At the regional level, import tonnages were fairly volatile from year to year in response to operating schedules of large minerals projects. A noticeable 'trough' in import tonnages, due to a fall in economic activity in 2001–02, affected nearly all Northern Australia's regions' imports, but there was no corresponding drop in export tonnages in that year, except for a small decline in the Darwin-East Arnhem export tonnages (see Table 6.1.1 and Table 6.1.3). More detailed data on import and export tonnages can be found in the background tables listed at the back of this chapter.

Northern Australia – imports via sea ports, 1996–97 to 2007–08 (thousand tonnes) Table 6.1.3

egion	1996-97	1997–98	1998–99	00-6661	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	Per cent of Australia's imports via sea oorts, 2007–08
Vorthern Australia (WA)	383.1	313.1	341.1	713.8	419.7	381.2	740.9	686.0	1 087.1	1 289.0	I 454.5	I 697.8	0.6
Pilbara Region	312.8	256.0	297.8	566.3	358.4	305.6	662.5	641.7	997.3	1 161.3	I 148.3	I 387.2	0.5
ort Hedland	41.5	18.6	19.9	159.7	133.0	71.7	174.2	226.3	449.0	566.7	623.7	792.0	0.3
Kimberley Region	70.3	57.I	43.3	147.4	61.3	75.5	78.4	44.2	89.8	115.5	193.6	270.6	0.1
<b>NA offshore terminals</b>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	106.7	0.0	0.0
VA ports (islands)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.2	5.9	40.0	0.0
Western Australia state total	37 294.2	35 805.6	38 958.7	36 358.5	29 271.5	36 890.9	41 830.8	44 066.3	48 740.0	44 788.I	47 735.5	53 145.0	17.7
Vorthern Australia (NT)	I 983.4	I 920.3	I 834.9	2 238.9	1 964.6	I 826.5	I 806.2	2 098.7	3 193.0	4 862.6	11 487.7	11 596.3	3.9
Darwin-East Arnhem Region	I 102.8	986.1	941.9	1 211.8	897.5	749.1	829.8	I 165.8	2 226.9	3 682.4	10 328.9	10 383.3	3.5
Confidentialised NT ports	880.6	934.2	893.0	I 027.I	1 067.1	I 077.4	976.4	932.9	966.0	I 168.3	1 139.9	I 168.6	0.4
VT ports (island)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0:0	0.0	11.9	18.9	44.4	0.0
Vorthern Territory total	I 983.4	I 920.3	I 834.9	2 238.9	I 964.6	I 826.5	I 806.2	2 098.7	3 193.0	4 862.6	11 487.7	11 596.3	3.9
Vorthern Australia (OLD)	9 065.4	8 036.1	9 178.1	9 229.9	8 978.6	9 257.6	10 676.7	11 047.4	11 559.7	12 817.3	11 542.4	12 243.5	4.1
Mackay Region	175.2	150.1	142.0	130.9	191.2	222.7	222.8	282.1	239.2	496.6	472.0	606.4	0.2
Northern Region	7 625.7	6 688.3	7 641.5	7 599.7	7 200.6	7 528.I	8 794.7	8 937.7	8 891.9	9 397.0	8 128.8	8 755.6	2.9
Far North Region	321.6	307.7	283.2	211.4	303.3	259.I	642.0	748.7	789.4	821.2	814.8	755.I	0.3
North West Region	0.0	0.0	0.0	0.0	0.0	0.1	3.7	0.3	0.0	0.0	0.0	0.0	0.0
lockhampton region	1.1	5.9	I.8	6.3	0.0	8.4	3.7	0.0	0.0	0.4	0.0	0.0	0.0
Gladstone region	931.8	884.2	1 109.7	1 281.7	I 283.6	I 239.2	I 009.8	I 078.6	I 639.2	2 101.5	2 126.8	2 126.3	0.7
QLD ports (islands)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.1	0.0	0.0
Queensland state total	30 269.2	31 624.1	34 581.7	36 609.4	34 148.9	34 282.7	39811.1	41 314.7	44 299.3	45 449.0	47 618.8	49 656.8	16.5
													1
Vorthern Australia subtotal	11 432.0	10 269.5	11 354.1	12 182.6	11 363.0	11 465.3	13 223.8	13 832.1	15 839.8	18 969.0	24 484.6	25 537.5	8.5
Australia total	185 297.2	186 942.9	208 925.7	205 097.0	201 542.1	211 930.8	226 496.7	235 861.1	252 133.4	257 833.3	276 976.1	300 253.2	1 00.0

BITRE (2009), unpublished data. Source: Tonnage imported by regions via sea ports is illustrated in Figure 6.1.9. Regions' imports are strongly related to development of large minerals projects, such as the Darwin-East Arnhem Region experienced between 2006–07 and 2007–08. Another strong importer has been the Northern Region in Queensland.

Western Australia's northern regions' imports are very small, as compared with that state's total imports via sea ports.



# Figure 6.1.9 Northern Australia—import tonnage, via sea ports, by region, 1996–97 to 2007–08 (million tonnes)

Source: BITRE (2009), unpublished data.

Figure 6.1.10 illustrates the relative sizes of imported tonnages via sea ports in Northern Australia between 1996–97 and 2007–08. These imports are largest in proportion to the state's total imports in Queensland (25 per cent in 2007–08) and Northern Territory (all imports in all years, as all Northern Territory ports are within the Darwin-East Arnhem Region with an access to sea ports). In the case of the northern regions of Western Australia, imports via sea ports were very small and represented only 3 per cent of the respective total Western Australian imports in 2007–08. This is, partially, due to operational practices by large minerals operators, who acquire materials and supplies (including imports) via operating centres located in southern states or capitals, such as Perth, Freemantle, et cetera. These imports are frequently landed in southern regions and then distributed to operational sites in northern regions and therefore are counted as southern regions imports.



Figure 6.1.10 Northern Australia – import tonnage via sea ports, by state, 1996–97 to 2007–08 (million tonnes)

## Import value

Northern Australia's values of 'direct' imports via sea ports was only 2 per cent of the corresponding Australian value of imports in 2007–08 (see Table 6.1.4). The discrepancy between larger tonnage of imports per capita in Northern Australia and the lower value of those imports, as compared with the value of Australian imports via sea ports, may suggest that some imports are reaching Northern Australia through southern Australia. Part of the imported production supplies and consumer goods reaches Northern Australian ports as coastal shipments or by road, for which information on value is not collected. For example, supplies of imported groceries and other consumer products to larger retail companies in Northern Australia are transported via roads or rail (mostly in northern Queensland). Data on final destination or use of these imports is not collected or not publicly available.

The value of Northern Australia's imports via sea ports is related to major minerals projects, between 1996–07 and 2007–08, as can be seen in Figure 6.1.11. The illustrated major peaks in import values for the Darwin-East Arnhem, Northern, Gladstone and Pilbara regions coincide with various stages of completion of gas, oil, bauxite, alumina and other minerals projects in Northern Australia. For example, peaking import values via Gladstone ports are related to completion of the alumina and aluminium projects in that region in 2004–05.

Table 6.1.4 North	ern Austı	ralia — in	nports v	ia sea p	orts by	region,	1996–97	7 to 200	7-08 (\$	million	()		
Region	1996–97	1997–98	1998–99	00-6661	2000-01	2001–02	2002–03	2003–04	2004-05	2005-06	2006–07	2 <i>007–08</i> bo	Per cent of Australia's imports via sea rts in 2007–08
Northern Australia (WA)	463.9	361.2	472.7	I 498.8	289.6	281.2	969.7	425.3	1 362.9	1 863.6	2 934.8	2 451.0	0.4
Pilbara Region	445.2	344.1	464.1	1 351.9	243.6	232.9	929.0	410.0	1314.1	I 784.4	2 498.4	1 960.7	0.3
Kimberley Region	18.6	17.1	8.6	146.9	46.0	48.3	40.7	15.2	48.8	78.2	421.0	490.3	0.1
WA offshore terminals	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	15.4	0.0	0.0
WA ports (islands)	0:0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	38.4	46.4	573.9	0.1
Western Australia state total	26 922.1	29 442.0	29 505.2	30 608.0	31 083.3	32 919.5	40 895.9	39 532.I	48 865.2	56 114.8	65 820.9	76 959.4	12.0
Northern Australia (NT)	774.2	985.4	676.0	2 611.4	1 043.9	1 182.6	1 773.5	1 615.5	2 450.4	2 474.7	4 488.0	4 793.6	0.7
Darwin-East Arnhem Region	670.3	884.5	583.7	2 469.7	818.2	973.4	I 593.2	I 442.5	2 247.7	I 867.0	3 820.9	4 439.7	0.7
Confidentialised NT ports	103.9	100.9	92.3	141.7	225.7	209.2	180.3	173.0	202.7	607.7	667.0	353.8	0.1
NT ports (island)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0:0	0.1	0.0	0.0
Northern Territory total	774.2	985.4	676.0	2 611.4	I 043.9	182.6	1 773.5	1 615.5	2 450.4	2 484.6	4 501.3	4 839.6	0.8
Northern Australia (QLD)	1 101.0	I 085.5	I 500.3	1 361.0	1 367.1	1 516.1	I 746.3	1 990.0	6 869.9	4 069.8	3 849.5	5 417.0	0.8
Mackay Region	47.4	47.7	0.001	22.5	39.7	90.4	79.4	83.3	133.6	354.1	305.4	437.3	0.1
Northern Region	561.0	708.8	975.2	898.1	787.4	905.6	I 094.3	I 327.I	I 505.3	I 999.3	2 187.5	3 352.8	0.5
Far North Region	114.2	100.0	1.0.1	121.6	232.2	160.0	310.9	354.5	546.0	973.4	767.8	875.6	0.1
North West Region	0.0	0.0	0.0	0.0	0.0	0.7	27.3	2.2	0.0	0.0	0.0	0:0	0.0
Rockhampton region	59.1	54.1	106.5	28.4	0.0	3.8	1.4	0.2	0.0	I.0	0.0	0.0	0.0
Gladstone region	319.3	174.9	208.5	290.4	307.8	355.8	233.0	222.6	4 684.9	742.0	588.8	751.2	0.1
QLD ports (islands)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.7	0.3	2.2	0.0
Queensland state total	19 004.0	22 616.7	24 490.1	28 854.5	32 931.4	33 266.1	38 364.1	40 063.6	50 007.3	58 608.7	64 975.6	74 874.9	11.7
Northern Australia subtotal	2 339.1	2 432.1	2 649.0	5 471.2	2 700.6	2 979.9	4 489.6	4 030.8	10 683.2	8 408.0	11 272.2	12 661.6	2.0
Australia total	265 022.3	297 489.2	315 694.4	346 188.5	378 858.6	387 710.5	426 617.3	418 894.3	478 556.1	527 807.5	578 151.2	642 410.4	100.0
Source: BITRE (2009), unput	blished data.												

Chapter 6 | Transport





Source: BITRE (2009), unpublished data.

## Coastal shipping—loaded tonnage

Coastal shipping consists of goods loaded in Australian ports on Australian or foreign ships and (unloaded) delivered to other destinations within the Australian customs area. Typically, distribution of liquid fuels and fuel components from refineries located in sea ports to major agglomerations along the Australian coast is designed to use coastal shipping for the long haul and rail/road for the final part of transportation. Similarly, building materials, chemicals, construction steel, machinery and supplies are transported via coastal shipping. A special role is played by coastal shipping in supplying remote and isolated communities in Northern Australia. Vital supplies are delivered on barges to many locations along the coast, such as Nhulunbuy (Northern Territory) and Kalumburu (Western Australia). This mode of delivery is vital during seasonal non-accessibility to those places via roads.

Coastal shipping volumes originating in Northern Australia represented 20 per cent of the total loaded tonnage in Australia, in 2006–07. The largest sources of coastal tonnages was from Western Australia's Pilbara Region, followed by Queensland's Far North and Northern regions (see Table 6.1.5). Commodities loaded in Northern Australia were mainly minerals, fuels and food products for processing at other Australian destinations.

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Region	1996–97	1 997–98	1998-99	00-6661	2000-01	2001-02	2002-03	2003-04	2004-05	200506	2006–07 A	Per cent of total loaded tonnes in ustralian ports in 2006–07
Northern Australia (WA)	27 298.9	28 166.3	24 561.5	24 013.8	11 480.3	20 449.2	29 674.6	36 147.7	19 048.0	29 779.8	32 690.6	6.7
Pilbara Region	27 274.0	28 068.9	24 439.0	20 835.9	9 254.8	19 603.5	27 979.0	34 783.2	17 176.9	27 924.5	31 062.9	6.4
Port Hedland	18 175.4	13 728.2	19 593.6	14 122.4	4 071.0	8 480.2	17 324.2	17 650.8	8 583.7	12 855.2	13 708.5	2.8
Kimberley Region	25.0	97.5	122.5	1 108.7	197.0	624.3	536.9	854.3	548.7	410.8	50.4	0.0
WA offshore terminals	0.0	0.0	0.0	868.7	79.8	221.4	171.3	0.0	55.4	567.9	809.7	0.2
WA ports (islands)	0.0	0.0	0.0	I 200.5	1 398.7	0.0	987.5	510.2	1 267.1	876.6	767.6	0.2
	0.0	0.0	0.0	0.0	550.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Western Australia state total	69 263.2	57 749.7	51 008.1	48 189.6	38 247.3	55 340.2	82 670.4	76 028.8	52 198.4	58 424.1	69 193.8	14.2
Northern Australia (NT)	1 372.1	3 029.2	2 756.1	1 780.5	3 334.9	3 758.0	3 263.4	3 102.7	5 804.1	1 737.0	540.0	0.1
Darwin-East Arnhem Region	1 372.1	2 999.9	2 649.6	I 715.8	3 026.2	3 757.8	3 262.0	3 102.7	5 798.9	I 737.0	540.0	0.1
Katherine-Lower Top End	0.0	0.0	60.0	51.3	0.0	0:0	0.0	0.0	0.0	0.0	0.0	0.0
Confidentialised NT Ports	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rigs and offshore terminals	0.0	0.0	46.4	13.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NT ports (island)	0.0	0.0	0.0	0.0	308.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NT communities	0.0	29.3	0.1	0.3	0.0	0.2	E.I	0.0	5.2	0.0	0.0	0.0
Northern Territory total	I 372.I	3 029.2	2 756.1	1 780.5	3 334.9	3 758.0	3 263.4	3 102.7	5 804.1	1 737.0	540.0	0.1
Northern Australia (QLD)	18 887.7	19 846.3	22 458.3	48 796.6	57 623.6	46 218.2	37 996.7	45 494.6	63 152.7	63 304.3	64 096.2	13.2
Mackay Region	I 889.2	3 143.9	2 459.6	2 514.8	2 409.7	1 247.0	798.0	1 206.6	911.7	732.5	395.7	0.1
Northern Region	96.7	258.5	613.3	2 122.4	9 110.9	13 502.2	10 435.9	14 119.0	10 654.0	18 178.4	23 617.6	4.8
Far North Region	9 044.8	9 503.7	9 451.4	30 256.9	30 958.6	0.760 11	13 079.6	II 679.3	34 694.0	27 267.3	26 277.0	5.4
North West Region	0.0	71.6	58.9	193.4	102.8	202.5	109.9	794.9	1 124.6	I 223.6	0.0	0.0
Rockhampton region	0.0	0.0	10.2	81.9	53.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gladstone region	7 856.9	6 868.6	9 859.5	13 627.3	14 988.	20 169.5	13 573.3	17 694.8	15 768.4	15 902.6	13 805.9	2.8
QLD ports (islands)	0.0	0.0	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
QLD unknown ports	0.0	0.1	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queensland state total	86 166.1	86 845.2	108 891.6	130 357.4	140 277.0	117 419.5	129 841.2	104 900.9	141 174.0	131 850.7	143 041.5	29.4
Northern Australia subtotal	47 558.7	51 041.8	49 775.9	74 590.9	72 438.8	70 425.3	70 934.7	84 745.0	88 004.8	94 821.1	97 326.7	20.0
Australia total	336 881.7	323 379.0	307 024.3	397 156.1	447 139.7	373 846.1	415 236.4	375 419.6	401 081.8	428 538.8	487 049.2	1 00.0
Note: At the time of preparation Source: BITRE (2009), unpublished	n data for 20 I data.	007-08 was	not available									

Note: Source: 145

Tonnages loaded indicate volatility but also growth over time (see Figure 6.1.12). Northern Australia's loaded tonnages in coastal shipping more than doubled, while total Australian loaded tonnages increased by about 1.5 times, between 1996–97 and 2006–07. The strongest growth of loaded coastal shipping tonnages was observed in northern regions of Queensland and a sharp fall was noted in the Northern Territory, where loaded tonnages grew strongly until 2004–05, then fell in 2006–07 to about 40 per cent of their 1996–97 levels (see Figure 6.1.13). This fall in using coastal shipping coincides with the opening of the direct railway line between Darwin and Adelaide in 2004–05. Queensland's Northern Region had the strongest dynamics in loaded costal shipping tonnages, which is related to the bauxite operations via Weipa (see Figure 6.1.14). Western Australia's Kimberley Region experienced large increase and then a decline in loaded tonnages largely due to shipments of energy commodities through this region between 1998–99 and 2006–07.





Source: BITRE (2009), unpublished data.



Figure 6.1.13 Northern Australia—coastal shipping, loaded tonnage, by region, 1996–97 to 2006–07 (index 1996–97 = 100)

Figure 6.1.14 Northern Australia—coastal shipping, loaded tonnage, by region, 1996–97 to 2006–07 (index 1996–97 = 100)



Source: BITRE (2009), unpublished data.

## Coastal shipping—unloaded tonnage

Tonnages unloaded in Northern Australia coastal shipping represented 14.3 per cent of the corresponding Australian total sea port tonnages in 2006–07. A majority of the unloaded tonnages were: mineral fuels, lubricants and related materials; manufactured goods; commodities; and machinery and transport equipment. The largest tonnages unloaded were in the Northern and Gladstone regions of Queensland (see Table 6.1.6). Queensland's northern regions represented nearly one-third of the total unloaded coastal tonnage intrastate, whilst the northern regions of Western Australia unloaded only 6 per cent of coastal sea freight of that state.

Unloaded tonnages in Northern Australia indicated strongest growth in Queensland's northern regions, especially after 2002–03 however, the growth rate of the northern regions was weaker than that for the rest of Queensland (see Figure 6.1.15). For most other regions the growth rates of unloaded tonnages were weaker and volatile and fell below their 1996–97 levels. Following the economic slowdown, by 2000–01, most northern regions and state total tonnages unloaded fell and then slightly recovered by 2001–02 (tables with unloaded tonnages by groups of commodities and years are available in the Internet version of this publication).



Figure 6.1.15 Northern Australia—coastal shipping, unloaded tonnage, by state, 1996–97 to 2006–07 (index 1996–97 = 100)

Source: BITRE (2009), unpublished data.

Table 6.1.6 Northern	Australia	ı—coast	al shipp	ing, unle	oaded to	nnage,	1996–97	to 2006-	-07 (tho	usand to	onnes)	
Region	1996–97	1 997–98	1998-99	00-6661	2000-01	2001–02	2002-03	200304	2004-05	2005-06	2006–07	Per cent of total loaded tonnes in wstralian ports in 2006–07
Northern Australia (WA)	11 180.0	3 854.4	4 827.6	3 498.4	3 217.8	5 705.0	4 442.3	6 714.1	1 699.7	2 373.8	6 173.5	I.3
Pilbara Region	5 755.4	I 288.3	2 785.6	1 016.5	2 108.0	2 035.4	2 625.8	5 583.1	1513.9	2 335.3	4 472.4	0.9
Port Hedland	2 396.7	I 288.3	I 408.7	1 016.5	I 503.4	2 035.4	933.9	4 113.8	1513.9	2 335.3	3 462.9	0.7
Kimberley Region	5 424.6	2 566.1	2 042.0	2 476.1	I 109.8	3 669.5	1816.5	1.131.1	185.8	38.6	1 701.2	0.3
WA offshore terminals	0.0	0.0	0.0	5.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Western Australia state total	39 899.9	29 649.2	27 335.6	27 715.1	30 239.3	27 900.3	24 406.4	32 797.I	25 228.6	26 681.8	30 764.2	6.3
Northern Australia (NT)	28 162.8	7 687.3	12 734.8	11 888.2	15 931.9	15 342.4	15 771.4	21 870.6	11 052.0	9 614.5	12 020.5	2.5
Darwin-East Arnhem Region	28 162.8	7 687.3	12 572.3	III 843.6	15 931.9	15 342.4	15 771.4	21 870.6	11 052.0	9 614.5	12 020.5	2.5
Rigs and offshore terminals	0.0	0.0	94.0	28.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NT communities	0.0	0.0	68.5	16.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Northern Territory total	28 162.8	7 687.3	12 734.8	11 888.2	15 931.9	15 342.4	15 771.4	21 870.6	11 052.0	9 614.5	12 020.5	2.5
Northern Australia (QLD)	41 958.2	31 583.1	40 325.0	53 669.8	37 177.1	45 962.8	34 633.6	47 433.4	41 631.8	46 958.5	51 213.5	10.5
Mackay Region	4 848.9	2 643.7	2 503.5	3 126.4	3 112.5	3 543.8	3 055.9	2 379.3	2 182.3	2 788.0	2 727.2	0.6
Northern Region	8 088.9	8 784.9	14 560.4	19 748.6	13 845.7	15 310.4	11 124.7	17 088.9	16 572.0	18 411.6	21 030.2	4.3
Far North Region	13 170.3	8 818.6	8 028.9	17 719.9	7 446.7	8 328.0	5 914.7	9 761.1	6 658.6	5 573.4	3 980.4	0.8
North West Region	0.0	48.I	0.0	34.6	8.3	121.4	0.0	0.0	8.2	0.0	0.0	0.0
Rockhampton region	0.0	0.0	79.9	32.7	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gladstone region	15 850.2	11 235.3	15 087.8	12 993.1	12 713.5	18 659.1	14 538.3	18 204.2	16 210.7	20 185.5	23 475.7	4.8
QLD unknown ports	0.0	52.5	64.5	14.3	48.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queensland state total	92 050.3	100 446.8	86 820.7	114 373.6	90 277.3	107 505.2	105 653.5	108 397.3	125 819.7	148 121.6	155 000.0	31.8
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Australia total	471 290.7	427 593.7	361 506.0	511 727.9	447 336.1	487 516.3	415 236.4	375 419.6	401 081.8	428 538.8	487 049.2	0.001

149

At the time of preparation, data for 2007–08 was not available. BITRE (2009), unpublished data.

Source: Note:

Unloaded coastal shipping tonnages by region indicated volatility and a decline in northern regions of Western Australia and Northern Territory during the period 1996–97 and 2006–07 (see Figure 6.1.16). More diversity in dynamics was observed in Queensland's northern regions. While Queensland's Northern Region's unloaded tonnage increased by 2.5 times between 1996–97 and 2006–07 and Gladstone's by 1.5 times in the corresponding period, the rest of Queensland's regions experienced a decline in unloaded coastal shipping tonnages (see Figure 6.1.17).

#### Figure 6.1.16 Northern Australia (Western Australia and Northern Territory) coastal shipping, unloaded tonnage, by region, 1996–97 to 2006–07 (index 1996–97 = 100)



Source: BITRE (2009), unpublished data.



Figure 6.1.17 Northern Australia (Queensland) – coastal shipping, unloaded tonnage, by region, 1996–97 to 2006–07 (index 1996–97 = 100)

## Sea ports

Maritime shipping in Northern Australia has been conducted via a number of port facilities, working platforms and small islands. Many ports are specialised in handling designated commodities, such as gas, oil or coal, but a number of ports handle general cargo and containers, as well as bulk loads of minerals and energy. Table 6.1.7 lists selected major ports in Northern Australia. Some of these listed ports support larger communities and a more diverse economy, such as Mackay, Rockhampton or Mourilyan. Others are more specialised, such as Weipa (bauxite) or Port Douglas (tourism).

Table 6.1.7	Northern Australia—selee	cted ports,	by region, 2009	
Region/SLA name	Port name popu	Total SLA/UCL ulation (2006)	Main operations	Port operators
Northern Australia (	(MA)			
Dilham Dorion				

Region/SLA name	Port name	Total SLA/UCL population (2006)	Main operations	Port operators	Commercial operators
Northern Australia (WA)					
Pilbara Region					
Port Hedland (T)	Port Hedland	11 558	Iron ore, salt,	Port Hedland Port Authority	BHP Billiton Ltd and the Fortescue Metals Group Ltd
Ashburton (S)	Saladin Terminal	8 136	manganese Oil and gas	Non-port authority port	Chevron Australia
Kimberley Region					
Derby-West Kimberley (S)	Derby	8 352	Lead–zinc concentrate, cattle	Shire of Derby/West Kimberley	Small scale private ventures
Northern Australia (NT)					
Darwin-East Arnhem Region					
City-Inner	Port of Darwin	66 290	Petroleum, livestock, cement clinker	Darwin Port Corporation	A number of private operators installed specialised port facilities, such as the Vopak Darwin Acid Tank and pipeline or LNG facilities subported by commercial operators
Katherine-Lower Top End					
Gulf	Bing Bong	1 012	Lead-zinc concentrate	P&O Maritime on behalf of the Carpentaria Shipping Services (local community and business partnership)	McArthur River Mining Company

Northern Australia (QLD)					
Mackay Region					
Mackay (C)–Pt A	Mackay (Hay Point)	66 874	Coal	Ports Corporation of Queensland	Dalrymple Bay Coal Terminal leased by Babcock & Brown from the Queensland Government
Bowen (S)	Bowen (Abbot Point)	7 483	Coal	Ports Corporation of Queensland	Abbot Point BulkCoal Pty Ltd
Far North Region					
Cook (S)	Cape Flattery	4 804	Silica sand	Ports Corporation of Queensland	Cape Flettery Silica Mines Pty Ltd (Mitsubishi)
Douglas (S)	Port Douglas	16 753	Tourism	Douglas Shire Council	Small scale private ventures
Johnstone (S)	Mourilyan	19 155	Raw sugar, molasses, livestock	Ports Corporation of Queensland	Mourilyan Bulk Sugar Terminal
Torres (S)	Thursday Island	3 457	General cargo	Local community	Small scale private ventures
Weipa (T)	Weipa	3 141	Bauxite, livestock (cattle), fuel	Ports Corporation of Queensland	Rio Tinto Aluminium
North West Region					
Carpentaria (S)	Karumba	3 186	Zinc, lead, livestock	Ports Corporation of Queensland	Zinifex Mine
Rockhampton Region					
Fitzroy (S)–Pt A	Rockhampton	6 102	Coal, wheat, sorghum	Central Queensland Ports Authority	BHP Billiton Mitsubishi Alliance, Waratah Coal & other coal operators

## 6.2 Aviation

Aviation provides personal transport and freight over large distances in Northern Australia. Scheduled services connect distant destinations within the region, as well as major population centres and capital cities in Australia and overseas. Tables 6.2.1 and 6.2.2 list typical domestic and international distances and travelling times for air services in Northern Australia. Distances covered by regular public transport (RPT) services are usually in excess of 500 kilometres and travelling times are similar to those between major towns in many overseas destinations, such as in the United States, Canada and Europe. Cairns and Darwin have regular connections to many regional South Pacific destinations as well as to major cities in Japan, China and Indonesia. A substantial part of the growth in international transport has been associated with outback tourism in Northern Australia, especially inbound tourism from Japan.

# Table 6.2.1Northern Australia — air travel distances and travel times on<br/>major domestic port pairs, 2007–08

Port þair	Distance (kilometres)	Air travel time
Northern Australia (WA)		
Karratha–Perth	250	l h 55 m
Broome–Perth	677	2 h 30 m
Kalgoorlie–Perth	538	I h 05 m
Perth–Port Hedland	3 2	2 h 05 m
Perth–Newman	1019	I h 40 m
Paraburdoo–Perth	990	I h 40 m
Learmonth–Perth	I 094	l h 55 m
Broome–Kununurra	731	I h 20 m
Derby–Curtin–Perth	78	2 h 50 m
Broome–Melbourne	3 109	4 h 05 m
Northern Australia (NT)		
Brisbane–Darwin	2 852	4 h 00 m
Darwin–Melbourne	3   3	4 h 15 m
Darwin–Sydney	3 155	4 h 20 m
Adelaide–Darwin	2 619	3 h 35 m
Alice Springs–Darwin	I 305	2 h 00 m
Darwin–Perth	2 65 1	3 h 45 m
Alice Springs–Melbourne	I 860	2 h 35 m
Alice Springs–Sydney	2 022	2 h 50 m
Adelaide–Alice Springs	3 6	l h 55 m
Darwin–Gove	647	I h 15 m
Northern Australia (QLD)		
Brisbane–Cairns	39	2 h 20 m
Brisbane–Townsville	2	2 h 00 m
Cairns–Sydney	97	2 h 55 m
Brisbane–Mackay	797	I h 35 m
Brisbane–Rockhampton	518	Ih 15 m
Cairns–Melbourne	2 311	3 h 20 m
Brisbane–Gladstone	434	I h 05 m
Brisbane–Hamilton Island	888	I h 45 m
Sydney–Townsville	I 690	2 h 45 m
Hamilton Island–Sydney	I 526	2 h 20 m

Source: BITRE (2009), unpublished data.

	1 0		•			
From	То	Distance (kilometres)	Air travel time	Inbound passengers	Outbound passengers	Total
Cairns	Auckland	3 622	4 h 45 m	28 546	25 199	53 745
	Guam	3 376	4 h 30 m	54	439	22 980
	Hong Kong	5 545	7 h 00 m	27 107	28 903	56 010
	Nagoya	5 862	7 h 30 m	44 017	50 396	94 413
	Osaka	5 803	7 h 30 m	42 584	36 917	79 501
	Port Moresby	841	I h 30 m	29 247	33 548	62 795
	Singapore	5 012	6 h 45 m	33 126	28 753	61 879
	Токуо	5 878	7 h 40 m	108 710	115 878	224 588
Darwin	Bandar Seri Begawan	2612	3 h 45 m	2 462	2 625	5 087
	Bombay	7 259	9 h 30 m	2 245		2 245
	Denpasar	I 766	2 h 45 m	20   92	19 407	39 599

# Table 6.2.2Northern Australia – air travel distances, travel times and<br/>passenger numbers, top ten international pairs

Source: BITRE (2009), unpublished data.

## Passenger and freight movements

The greatest number of domestic passenger movements in 2007–08 occurred in the Far North Queensland region, followed by MacKay Region and the Darwin-East Arnhem Region in the Northern Territory (see Table 6.2.3). For location of major airports (see Map 6.2.1). The large number of passengers travelling on regular air transport in Queensland is related to the size of the resident population of those regions, as well as inbound domestic and international tourism.

An important part of domestic transport in Northern Australia is related to 'flyin, fly-out' staff rotation arrangements in remote mining, geological services and, increasingly, agriculture. Air transport is used to carry workers from their places of residence to remote locations in Australia's north. While RPT services account for some of this activity, a significant proportion is carried on charter flights. Unfortunately, no detailed data is available on the charter sector.

			Air p	Jassenger move	ments				Freigh	it movement	S	
Region	Domestic inbound	Domestic outbound	Total domestic passenger movements	Total inter- national passenger movements	Total inbound	Total outbound	Total passenger movements	Inter- national inbound (tonnes)	Inter- national outbound (tonnes)	Total inter- national freight (tonnes) n	Per cent of Australia's passenger novements n	Per cent of Australia's freight 10vements
Northern Australia (WA)	686 650	691 775	I 378 425		686 650	691 775	I 378 425				1.4	0.0
Pilbara Region	440 147	441 123	881 270		440 147	441 123	881 270				0.9	0.0
Kimberley Region	246 503	250 652	497 155		246 503	250 652	497 155				0.5	0.0
Western Australia state total	4 247 570	4 273 587	8 521 157	2 477 820	5 522 779	5 476 198	10 998 977	37 257	31 462	68 719	8.7	8.8
									į			
Northern Australia (NT)	1 1 10 016	1 123 804	2 233 820	173 243	1 196 824	1 210 239	2 407 063	127	171	298	2.3	0.0
Darwin-East Arnhem Region	799 797	806 598	I 606 395	173 243	886 605	893 033	I 779 638	127	171	298	l.6	0.0
Barkly-Central NT Region	310 219	317 206	627 425		310219	317 206	627 425				0.6	0.0
Northern Territory total	1 291 091	1 304 694	2 595 785	173 243	1 377 899	1 391 129	2 769 028	127	171	298	2.7	0.0
Northern Australia (QLD)	3 346 139	3 350 227	6 696 366	655 919	3 677 180	3 675 105	7 352 285	2 348	4 318	6 666	6.9	0.9
Mackay Region	824 012	827 127	1 651 139		824 012	827 127	1 651 139				1.7	0.0
Northern Region	729 114	730 359	I 459 473		729 114	730 359	I 459 473				I.5	0.0
Far North Region	I 647 087	I 645 404	3 292 491	655 919	I 978 I28	1 970 282	3 948 410	2 348	4318	6 666	3.4	0.9
North West Region	130 902	131 278	262 180		130 902	131 278	262 180				0.3	0.0
Longreach Region	15 024	16 059	31 083		15 024	16 059	31 083				0.0	0.0
Queensland state total	13 775 314	13 772 015	27 547 329	4 901 846	16 244 376	16 204 799	32 449 175	48 526	47 085	95 611	28.2	12.2
Northern Australia subtotal	5 142 805	5 165 806	10 308 611	829 162	5 560 654	5 577 119	11 137 773	2 475	4 489	6 964	10.6	0.9
Australia total	48 792 013	48 792 013	97 584 026	23 264 573	60 565 536	60 283 063	120 848 599	474 050	306 943	780 993	100.0	100.0
Note: Data on domestic air Source: BITRE (2009), unpubli	freight is not ished data.	available.										

Northern Australia – air passenger and freight movements, 2007–08 Table 6.2.3

Chapter 6 | Transport



#### Map 6.2.1 Northern Australia – major airports, roads and railway, 2009

Source: Geoscience Australia (2009), unpublished.

Regular international air freight transport to Cairns and Darwin (see Table 6.2.2) allows for imports and exports of higher value goods and perishables, such as exports of fresh products from Queensland to some Asian markets. It also provides an important supply route for higher value-added products to Northern Australia. Data on the tonnage of domestic airfreight is not available.

Figure 6.2.1 illustrates the total domestic RPT passenger movements in the northern regions of Queensland and Northern Territory in 2007–08. These passenger movements, when compared with the size of resident populations of these regions, indicate that domestic air transport has been used much more frequently in Northern Australia than in the rest of Australia. The average number of domestic flights per capita of residents of Northern Australia in 2007–08 was several times higher than in Australia and in their respective states. Figure 6.2.2 indicates that the number of domestic flights per resident of Pilbara and Kimberley regions was 4.5 times higher than the Australian and Western Australian averages. For Queensland's northern regions, these averages were higher than those for Queensland and Australia but relatively lower than for northern regions of the Northern Territory and Western Australia. Northern Australia's high level of flying frequency is largely related to long travel distances related to the remoteness of those locations and the use of regular air transport in the above mentioned periodic staff rotations in remote mining, services and other sectors.



Figure 6.2.1 Northern Australia – RPT domestic passenger movements in northern regions and state totals, 2007–08

Figure 6.2.2 Northern Australia – domestic flights per capita by region, 2007–08



 Note:
 Data illustrates scheduled services only, charter flights are not included. Flying trips (domestic flights) are calculated by dividing passenger movements by the resident population.

 Source:
 BITRE (2009), unpublished data.

Aircraft movements by regular public transport services in Northern Australia accounted for nearly 13 per cent of total Australia's RPT aircraft movements in 2007–08. These relatively large numbers of aircraft movements were required in providing regular services to about 4.7 per cent of the Australian population located in Northern Australia. Table 6.2.4 also indicates that air services are concentrated in relatively few regions, such as the Far North and Northern regions of Queensland, as well as in Darwin-East Arnhem in the Northern Territory and the Pilbara and Kimberley regions in Western Australia.

Some relatively large communities and important regional business centres did not have regular air services in 2007–08, although they had these services in 2005. Among them are Katherine and Tennant Creek in the Katherine-Lower Top End Region of the Northern Territory, Cooktown and Weipa in the Northern Region of Queensland.

Region	Domestic	International	Total movements	Per cent of state total
Northern Australia (WA)	20 081		20 081	18.9
Pilbara Region	11 145		11 145	10.5
Exmouth	693	697	390	1.3
Port Hedland	2 588	0.0	2 588.0	2.4
Kimberley Region	8 936		8 936	8.4
Western Australia state total	93 801	12 548	106 349	100.0
Northern Australia (NT)	31 900	3 421	35 321	89.0
Darwin-East Arnhem Region	25 548	3 421	28 969	73.0
Darwin	14 959	3 421	18 380	46.3
Barkly-Central NT Region	6 352	0.0	6 352.0	16.0
Alice Springs	6 352		6 352	16.0
Northern Territory total	36 274	3 421	39 695	100.0
Northern Australia (QLD)	92 972	7 526	100 498	31.6
Mackay Region	16 907		16 907	5.3
Mackay town	10 034		10 034	3.2
Northern Region	21 103		21 103	6.6
Townsville	19 205		19 205	6.0
Far North Region	42 607	7 526	50   33	15.8
Weipa	I 782		I 782	0.6
Cairns	35 461	7 526	42 987	13.5
North West Region	11 410		11 410	3.6
Mount Isa	4 848		4 848	1.5
Longreach Region	945		945	0.3
Longreach	945		945	0.3
Queensland state total	283 918	34 253	318 171	100.0
Northern Australia subtotal	144 953	10 947	155 900	12.7
Australia total	I 092 884	138 358	23  242	100.0

#### Table 6.2.4Northern Australia – aircraft movements and RPT, 2007–08

Source: BITRE (2009), unpublished data.

Table 6.2.5 illustrates aircraft movements at selected Northern Australian airports in various fixed-wing weight categories, as well as helicopters. The data also lists regular public transport aircraft movements in these airports. The share of RPT in the total

aircraft movements varied from 26.2 to 47.9 per cent, thus indicating that a majority of aircraft movement are non-scheduled. The published data remains incomplete but it indicates that staff rotations, expert services and some categories of supplies are being carried out by charter operators. This includes: transport of passengers (largely 'fly-in, fly-out' of miners, engineering staff); transport of platform crews and light weight supplies from airports to platforms and back; provision of over-flying geological services; provision of health services; aerial surveying; transport of equipment and provisions to mines; and pipeline building and maintenance, et cetera.

Arrival port name	Over 136 tonnes	Between 7 and 136 tonnes	Less than 7 tonnes	Helicopter	Unknown weight	Total of all aircraft movements	Total RPT	Per cent of RPT in total aircraft movements
Alice Springs	4	8 488	14 486	I 264		24 242	6 352	26.2
Cairns	5 1 2 2	40 096	35 814	8 674	2	89 708	42 987	47.9
Townsville	12	24   54	18 668	4 2		44 246	19 205	43.4
Rockhamptom	42	15 108	17 676	1612		34 438	10 496	30.5
Hamilton Island		4 034	3 242	3 990		11 266	4 372	38.8

# Table 6.2.5Northern Australia – aircraft movements in selected Northern<br/>Australian airports, as at November 2008

Notes: Movements are the sum of Arrivals and Circuits multiplied by 2. Arrival data is only recorded during hours of tower operation, therefore actual movements at non non-manned locations may be higher than published. The Air Services' aircraft movements data include regular air transport, chartered and owner-operator flights. Rockhampton was included in this table as it is part of a very busy and important regional hub in an area extending into Northern Australia.

Source: Airservices Australia (2009).

The accuracy of the aircraft movement records in Northern Australia cannot be verified as some airstrips and smaller airports are not manned at all or only partially manned, therefore the undercount of the non-scheduled flying operations is likely to be substantial.

Regional aviation in Australia operates in a volatile economic and social environment which affects both the supply (air transport services) and demand side (passenger numbers). This volatility affects the stability and reliability of air services, particularly in Northern Australia, where international demand for locally-produced commodities and their price levels affect the need for air transport, as the number of affected workers may vary at various stages of business cycles. At the supply side, the general business conditions may impact upon availability and the cost of credit, thus affecting operators' ability to acquire aircraft, equipment and hiring of specialised staff.

As Northern Australia's air transport market is relatively small, adverse economic factors may impact upon the provision of air services more severely than for interstate services, where demand for air transport under difficult economic conditions may become smaller but would still allow for continued operations. Maps 6.2.2 to 6.2.7 illustrate the variability of connections by regular air services in Western Australia, the Northern Territory and Queensland, between 2000 and 2005. A number of regular connections disappeared over this period and new ones were created joining other localities, reflecting the changed demand. Occasionally, these adjustments are associated with insolvency of operators, such as that of MacAir Airlines, Queensland's

largest privately own regional airline servicing outback Queensland. MacAir was placed into voluntary administration in February 2009.<sup>14</sup>

The maps also illustrate the polygon-shaped air transport connections with and among more remote distant communities. These connections, which usually attract less passenger traffic than direct connections with capital cities, may in some instances require government support for sustainability and reliability. Generally, regular air transport connections among regional communities have become less numerous over the last decade, with fewer community centres enjoying regular air transport. At the same time, the aircraft serving the regional centres have become larger, flying longer distances between regional centres. This implies that the average distances to the nearest centre with regular air transport has been increasing over time in Northern Australia.



Source: Reproduced from BITRE (2008b).

<sup>14.</sup> MacAir serviced about 30 destinations in its network, with the link between Townsville and Mt Isa being the busiest. This route was important to the mining support infrastructure and was recently included in Qantas regional services.

# Map 6.2.3 Changes in intrastate air services between 2000 and 2005 on regional routes in Western Australia

- Regional routes where an average of less than three return flights a week commenced after 2000
- Discontinued regional routes in 2005 where an average of at least three return flights a week were provided in 2000
- Discontinued regional routes in 2005 where an average of less than three return flights a week were provided in 2000
- Regional routes where air services increased from an average of less than three return flights a week between 2000 and 2005
- Regional routes where air services decreased from an average of at least three return flights to less than three return flights a week between 2000 and 2005



Source: Reproduced from BITRE (2008b).

500

Kilometres

1 000

#### Map 6.2.4 Intrastate air services on regional routes in Northern Territory, 2005



----- Regional air routes with an average of at least three return flights a week in 2005

- - - Regional routes with an average of less than three return flights a week in 2005

0	300	600
	Kilometres	

Source: Reproduced from BITRE (2008b).

# Map 6.2.5 Changes in intrastate air services between 2000 and 2005 on regional routes in the Northern Territory



- --- Regional routes where an average of less than three return flights a week commenced after 2000
- - Discontinued regional routes in 2005 where an average of less than three return flights a week were provided in 2000
- Discontinued regional routes in 2005 where an average of at least three return flights a week were provided in 2000
- Regional routes where air services increased from an average of less than three return flights to at least three return flights a week between 2000 and 2005
- Regional routes where air services decreased from an average of at least three return flights to less than three return flights a week between 2000 and 2005

0	30	00	600
	14.1		

Kilometres

Source: Reproduced from BITRE (2008b).





0 350 700

Kilometres

Source: Reproduced from BITRE (2008b).



# Map 6.2.7 Changes in intrastate air services between 2000 and 2005 on regional routes in Queensland

 - - Regional routes where air services decreased from an an average of at least three return flights a week to less than three return flights a week between 2000 and 2005





## 6.3 Railways

The Northern Territory has the longest section of the standard gauge line, joining Darwin with Adelaide. The second longest standard gauge railway line is in the Pilbara Region but it does not join this region with the southern regions of Western Australia. In Queensland's north-eastern coastal regions, narrow gauge of 1067 mm railways join the northern regions with southern Queensland. Most other railways are of local significance and join *hinterland* resource locations with local port or processing plants, such as sugar mills, et cetera. Most of these railway lines are of narrow gauge, referred here as *light* and *other*. Generally, the Northern Australia's railway system provide specialised transport services to the mining and resource industries, while other typical railway services, such as passenger transport, general cargo or container services are only a limited part of their work, especially on the specialised 'pendulum' lines.

However, this dedicated railway system carries about 65 per cent of Australia's total rail freight (tonne kilometres), which is discussed below. Map 6.3.1 illustrates the location of main railway lines across Northern Australia.



#### Map 6.3.1 Northern Australia – main railway lines

Source: BITRE (2009), unpublished data.

## Northern Queensland

On the Mount Isa–Townsville rail corridor, the transport operations include shipments of bulk minerals, general freight services and livestock services. This corridor allows also for important regional passenger services.

With demand for Queensland coal predicted to continue to increase, Queensland Railways has implemented an infrastructure program to increase capacity of the coal supply chains in Queensland from mine by rail to ship. As about 85 per cent of the state's coal is produced from mines in the Bowen Basin, and the remainder from mines in the Moreton and Surat Basins, two railway systems are being developed and upgraded:

- Surat/Gladstone System includes the new Wiggins Island Coal Terminal (WICT) to be completed around 2011–12, based on export demand forecasts and the intention to move coal traffic from Barney Point Coal Terminal to WICT. The majority of the demand for WICT appears to be from the Moura System, more specifically from the Surat Basin.
- The Goonyella System is based on forecast to see coal demand increase by approximately 50 per cent from the 88 million tonnes per annum (Mtpa) hauled in the 2006–07 financial year to 130 mtpa and beyond.

## Northern Territory

The railway link between Darwin and Adelaide was completed in 2004 and resulted in a deviation of traffic from coastal shipping and road transport to railway, especially for the Northern Territory's Darwin-East Arnhem Region, but with only between 1 per cent and 2 per cent of Australia's railway tonnage it remains a niche market for the railway operators, despite expectations the service would be a gateway to Asia. Private company *FreightLink* operates six high-speed intermodal freight trains per week between Adelaide and Darwin with connecting rail services to other interstate locations. The freight trains can operate to a maximum length of 1.8 kilometres, axle load up to 23 tonnes and a maximum loading height of 6.5 metres above rail allowing double-stacking of containers on purpose-built well wagons. *FreightLink* provides track access to Great Southern Railway for use of the railway for the operation of the *Ghan* passenger train. The operator *Freightlink* says it transported more than 1.1 million tonnes in the 2006–07 financial year, up from almost 670 000 tonnes the year before.

The railway appears to have acted as a catalyst for mining developments along the corridor and has commenced the haulage of manganese ore between Bootu Creek mine and the Port of Darwin, the haulage of iron ore between Frances Creek and the Port of Darwin and is contracted to commence haulage of copper-gold concentrate from OZ Minerals Prominent Hill mine to the Port of Darwin. There are many other mines along the corridor that intend to commence operations because the railway provides a viable transport solution for their products. The development of new mines and expanded rail operations provide significant employment prospects for local residents and will drive growth in the regional economy.

The more significant mining opportunities along the corridor include the *BHP Billiton Olympic Dam Project, Western Plains Resources Peculiar Knob Project, Minemakers Wonarah Phosphate Project, Arafura Resources Nolan's Bore Project* and *Altona Resources Arckaringa Coal to Liquids Project.* 

## Western Australia

The Pilbara's rail network is used to transport iron ore from the inland operation to coastal ports of Port Hedland, Dampier and Camp Lambert/Port Walcott, which

handle bulk loads, especially iron ore, salt and liquid fuels, such as LNG, LPG and condensate. The railway network is owned and operated by *BHP Billiton Iron Ore* and the *Pilbara Rail Company*, a joint venture between *Hamersley Iron Pty Ltd* and *Robe River Iron Associates*. The State Agreements Act, which governs the Pilbara railway, obligates the railway owners to carry the freight of third parties upon reasonable terms and at reasonable charges, providing that this can be done without unduly prejudicing or interfering with their existing operations. Recently, access to the privately-owned railways was granted to a competitor *Fortescue* and other potential users. The major Pilbara train lines include:

- Mount Newman to Port Hedland, owned by BHP Iron Ore, distance 426 kilometres, tonnage: 63.5 Mtpa in 1999
- Paraburdoo to Dampier, owned by Hamersley Iron, distance 638 kilometres, tonnage: 61.5 Mtpa in 1999
- Yarrie to Port Hedland, owned by BHP Iron Ore
- Panawonica to Camp Lambert, owned by River Iron Associates, distance 200 kilometres, tonnage: 32 Mtpa in 1999
- West Angles to Camp Lambert, owned by Robe River, in development.

The freight density on the Northern Australia's railways is illustrated on Map 6.3.2.

#### Map 6.3.2 Northern Australia – assigned rail freight (kilotonnes), 2005



Source: BITRE (2009c).

## Characteristics of railway infrastructure

In Northern Australia, railways are not well developed in the spatial sense, with the railway density per square kilometre of less than 10 metres (see Figure 6.3.1 and Map 6.3.1). Rail density per square kilometre measures how intensive is the connection of selected areas with railways. This measurement has been frequently used in assessing the accessibility of particular areas in Europe, the United States and other countries.

Figures 6.3.1 and 6.3.2 illustrate the railway density (kilometres/square kilometres) in Northern Australia by region in 2006. In spite of reasonably well interconnected railway systems, such as that in the Northern Territory, the vast spaces of Northern Australia cannot be considered well served by railway transport. However, the railways are probably appropriate given the sparse population in many areas. The Kimberley Region in Western Australia does not have any railway lines



Figure 6.3.1 Northern Australia – railway density, by region, 2006

Source: BITRE (2009), unpublished data.

2006
region,
γ
of railways,
length
/pe and
Australia — ty
Northern
ole 6.3.1

Table 6.3.1   Northern Au	ustralia —	type and	length o	of railways	, by regi	on, 2006					
Region	Area (sq km)	Gauge: st (1435,	andard mm)	Gauge: no (1067 1	arrow mm)	Gauge:	light	Gauge:	other	Total number of	Total Length of railways
		Operational	Abandoned	Operational	Abandoned	Operational	Abandoned	Operational	Abandoned	railways	(kilometres)
Northern Australia (WA)	933 879	3 050								4	3 049.8
Pilbara Region	513 079	3 050								4	3 049.8
Northern Australia (NT)	1 175 211	17 820.6	43.5	48.9	0.0	0.0	0.0	0.0	0.0	25	17 913.0
Darwin-East Arnhem Region	153 619	8 357.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10	8 357.6
Katherine-Lower Top End Region	346 143	3 122.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	S	3 122.3
Barkly-Central NT Region	675 449	6 340.7	43.5	48.9	0.0	0.0	0.0	0.0	0.0	12	6 433.2
Northern Australia (QLD)	926 560	43.0	0.0	9 280.3	179.2	2 373.8	0.0	31.2	7.1	84	11 914.6
Mackay Region	101 998	0.0	0.0	2 441.1	0.0	989.2	0.0	0.0	7.1	17	3 437.4
Northern Region	80 039	0.0	0.0	I 408.1	31.8	546.4	0.0	0.0	0.0	20	I 986.3
Far North Region	273 162	43.0	0.0	I 389.4	140.8	730.8	0.0	0.0	0.0	27	2 304.0
North West Region	446 494	0.0	0.0	3 047.8	2.1	0.0	0.0	31.2	0.0	01	3 081.1
Longreach Region	23 561	0.0	0.0	132.0	0.0	0.0	0.0	0.0	0.0	0	0.0
Northern Australia total	3 035 651	20 913	44	9 329	179	2 374		31	7	113	32 877.4
Source: BITRE (2009), unpublished d	lata.										



# Figure 6.3.2 Northern Australia—type and length of operational railways, by region, 2006

6.4 Roads

Due to large distances between major centres of settlement and economic activities in Northern Australia, the road network consists of largely unsealed roads and smaller lengths of sealed principal and secondary roads (see Table 6.4.1, and Map 6.4.2). The length of the only dual carriage road (around Darwin) is 29 kilometres. The majority of roads in Northern Australia are unsealed minor roads and tracks, many of which are seasonal and may not be accessible for parts of the wet season.

Road transport is typically used in Northern Australia for provision of groceries and other living supplies and other production supplies, such as machinery, equipment, et cetera.

				C			D								
Region	Area (sq km)	Dual carriage ways, length (km)	Principal   length (	roads, km)	Secondary length (	roads, km)	∑ ≥	linor roads, :ngth (km)		Trac. length	cs, (km)	Total length of sealed roads (km)	Total length of unsealed roads (km)	Total length of roads and tracks	Road density sealed and unsealed
	I	Sealed	Sealed	Unsealed	Sealed	Unsealed	Sealed	Unsealed	Unknown	Sealed	Unsealed	Sealed	Unsealed	(km)	
Northern Australia (WA)	933 879		3 35	485	579	1 697	633	10 849			64 193	4 563	77 224	81 787	0.1
Pilbara Region	513 079		1 668	176	579	767	395	6 476			33 885	2 642	41 304	43 946	0.1
Kimberley Region	420 799		l 683	309		930	238	4 373			30 308	1 921	35 920	37 841	0.1
Northern Australia (NT)	1 175 211	29	3 307	582	I 452	I 523	1 931	15 755			98 62	6719	116 481	123 200	0.1
Darwin-East Arnhem Region	153 619	29	439		207		1 209	5 491			12 585	I 884	18 076	096 61	0.1
Katherine-Lower Top End Region	346 143		I 308	_	503	790	425	4 186			26 216	2 236	31 193	33 429	0.1
Barkly-Central NT Region	675 449		I 560	581	742	733	297	6 078			59 820	2 599	67 212	69 811	0.1
Northern Australia (QLD)	926 560		7 923	815	3 076	4 461	4 43	31 141	39	2	128 950	15 430	165 367	180 838	0.2
Mackay Region	101 998		1 349	6	I 155	415	I 683	6169			16 830	4 187	24 173	28 360	0.3
Northern Region	80 039		1 075		451	231	908	4 275			11 518	2 434	16 024	18 458	0.2
Far North Region	273 162		1 213	06	939	1156	1 139	8 370	39		26 877	3 291	36 493	39 823	0.
North West Region	446 494		3 297	660	340	2 452	373	10 133		2	69 918	4 010	83 163	87 175	0.2
Longreach Region	23 561		188	56	102	201	29	1 177			3 435	319	4 869	5 188	0.2
Northern Australia total	3 035 65	29	14 581	I 882	5 107	7 681	6 995	57 745	39	2	291 764	26712	359 072	385 825	0.1

light average annual daily vehicle traffic (AADT) on major highways in Northern Australia, in 2005. Light vehicle and road freight density illustrated on Maps 6.4.1 and 6.4.2 indicate that road transport is being used heavily in north-eastern Queensland, and from South Australia to Darwin, via Alice Springs. These north-south links are more heavily used than east-west links. The most important road transport link east-west joins port of Townsville with the interior via Mount Isa to the Darwin to Adelaide highway and further west, via Broome to Port Hedland and then to southern Western Australia. This link provides relatively speedy transport of production supplies for mining but is also important for transporting cattle and other agricultural products

to major markets in Australia and overseas.

Source:

BITRE (2009), unpublished data. The network of primary and secondary roads provides access to communities and businesses around Northern Australia. Map 6.4.1 illustrates the assigned

Northern Australia – type and length of roads, by region, 2006 Table 6.4.1



#### Map 6.4.1 Northern Australia-assigned light vehicle traffic on major

#### Northern Australia-road freight density (kilotonnes), 2005 Map 6.4.2



## Roads—technical characteristics

Figure 6.4.1 illustrates the predominant role of unsealed roads in Northern Australia. With the exception of smaller northern regions of Queensland, such as Rockhampton, Bundaberg and Gladstone (not illustrated here), which are relatively close to larger agglomerations, accessibility to distant and remote locations is by unsealed roads. Largely sealed principal roads provide connection with the rest of Australia via the major transcontinental road network.



Northern Australia-road length (kilometres), by region, 2006 **Figure 6.4.1** 

Sources: BITRE (2009), unpublished data.

Road density (measured as kilometres of road per square kilometre) is very low in large regions of Northern Australia but reasonably high for smaller regions (see Figure 6.4.2) and the roads system is not used for haulage of large tonnages across Northern Australia. These large loads are delivered or exported predominantly via sea ports, as discussed earlier in this chapter.



Figure 6.4.2 Northern Australia – road density, by region, 2006

# Data relating to transport available in the online compendium

Trade via maritime ports

- Table Northern Australia-sum of export tonnes by ports, 1996-97 to 2007-08
- Table Northern Australia-sum of import tonnes by ports, 1996-97 to 2007-08
- Table Northern Australia—sum of discharged (unloaded) tonnes (coastal shipping) by ports, 1996–97 to 2006–07
- Table Northern Australia—sum of loaded tonnes (coastal shipping) by ports, 1996–97 to 2006–07
- Table Northern Australia-sum of export values by ports, 1996-97 to 2007-08
- Table Northern Australia-sum of import values by ports, 1996-97 to 2007-08
- Table Northern Australia—sum of export tonnes by ports, by group of commodities, 1996–97 to 2007–08

Sources: BITRE (2009), unpublished data.

- Table Northern Australia—sum of import tonnes by ports, by group of commodities, 1996–97 to 2007–08
- Table Northern Australia—sum of discharged (unloaded) tonnes (coastal shipping) by ports, by group of commodities, 1996–97 to 2006–07
- Table Northern Australia—sum of loaded tonnes (coastal shipping) by ports, by group of commodities, 1996–97 to 2006–07
- Table Northern Australia—sum of export values by ports, by group of commodities, 1996–97 to 2007–08
- Table Northern Australia—sum of import values by ports, by group of commodities, 1996–97 to 2007–08
- Table Northern Australia—imports by value (\$) via Northern Australia's ports, 1996–97 to 2007–08
- Table Northern Australia—exports by value (\$) via Northern Australia's ports, 1996–97 to 2007–08
- Figure 6.1.24 Northern Australia-value of goods imported via Western Australia's ports, 1996-97 to 2007-08
- Figure 6.1.25 Northern Australia—value of goods imported via Northern Territory's ports, 1996–97 to 2007–08
- Figure 6.1.26 Northern Australia—value of goods imported via Queensland's ports, 1996–97 to 2007–08
- Figure 6.1.27 Northern Australia—share of northern regions in the value of goods imported via Western Australia's ports, 1996–97 to 2007–08
- Figure 6.1.28 Northern Australia—share of northern regions in the value of goods imported via Northern Territory's ports, 1996–97 to 2007–08
- Figure 6.1.29 Northern Australia—share of northern regions in the value of goods imported via Queensland's ports, 1996–97 to 2007–08
- Figure 6.1.18 Northern Australia-value of goods exported via Western Australia's ports, 1996-97 to 2007-08
- Figure 6.1.19 Northern Australia—value of goods exported via Northern Territory's ports, 1996–97 to 2007–08
- Figure 6.1.20 Northern Australia—value of goods exported via Queensland's ports, 1996–97 to 2007–08
- Figure 6.1.21 Northern Australia—share of northern regions in the value of goods exported via Western Australia's ports, 1996–97 to 2007–08
- Figure 6.1.22 Northern Australia—share of northern regions in the value of goods exported via Northern Territory's ports, 1996–97 to 2007–08
- Figure 6.1.23 Northern Australia—share of northern regions in the value of goods exported via Queensland's ports, 1996–97 to 2007–08

- Table: Northern Australia—export tonnage by region and by commodity group, 1996–97 to 2007–08
- Table: export tonnage—animal & vegetable oils, fats & waxes
- Table: export tonnage beverages & tobacco
- Table: export tonnage-chemical & related products nes
- Table: export tonnage-commodities & transactions nes
- Table: export tonnage-crude materials, inedible, except fuels
- Table: export tonnage-food & live animals
- Table: export tonnage-machinery & transport equipment
- Table: export tonnage-manufactured goods classified chiefly by material
- Table: export tonnage-mineral fuels, lubricants & related materials
- Table: export tonnage-miscellaneous manufactured articles
- Table: Northern Australia—import tonnage by region and by commodity group, 1996–97—2007–08
- Table: import tonnage-animal & vegetable oils, fats & waxes
- Table: import tonnage beverages & tobacco
- Table: import tonnage-chemical & related products nes
- Table: import tonnage commodities & transactions nes
- Table: import tonnage-crude materials, inedible, except fuels
- Table: import tonnage food & live animals
- Table: import tonnage-machinery & transport equipment
- Table: import tonnage-manufactured goods classified chiefly by material
- Table: import tonnage-mineral fuels, lubricants & related materials
- Table: import tonnage-miscellaneous manufactured articles
- Table: Northern Australia—loaded tonnage—coastal shipping, by commodity group and region, 1996–97—2006–07
- Table: loaded tonnage animal & vegetable oils, fats & waxes
- Table: loaded tonnage-beverages & tobacco
- Table: loaded tonnage-chemical & related products nes
- Table: loaded tonnage-commodities & transactions nes
- Table: loaded tonnage—crude materials, inedible, except fuels
- Table: loaded tonnage food & live animals

- Table: loaded tonnage-machinery & transport equipment
- Table: loaded tonnage-manufactured goods classified chiefly by material
- Table: loaded tonnage mineral fuels, lubricants & related materials
- Table: loaded tonnage-miscellaneous manufactured articles
- Table: Northern Australia-discharged tonnage-coastal shipping, by commodity group and region, 1996–97–2006–07
- Table discharged tonnage—animal & vegetable oils, fats & waxes
- Table: discharged tonnage beverages & tobacco
- Table: discharged tonnage-chemical & related products nes
- Table: discharged tonnage commodities & transactions nes
- Table: discharged tonnage—crude materials, inedible, except fuels
- Table: discharged tonnage food & live animals
- Table: discharged tonnage machinery & transport equipment
- Table: discharged tonnage-manufactured goods classified chiefly by material
- Table: discharged tonnage-mineral fuels, lubricants & related materials
- Table: discharged tonnage-miscellaneous manufactured articles
- Table: Northern Australia—export values by region and by commodity group, 1996–97–2007–08
- Table: export values by region—animal & vegetable oils, fats & waxes
- Table: export values by region beverages & tobacco
- Table: export values by region chemical & related products nes
- Table: export values by region—commodities & transactions nes
- Table: export values by region crude mats, inedible, except fuels
- Table: export values by region—food & live animals
- Table: export values by region-machinery & transport equipment
- Table: export values by region-manufactured goods classified chiefly by materials
- Table: export values by region-mineral fuels, lubricants & related materials
- Table: export values by region-miscellaneous manufactured articles
- Table: Northern Australia—import values by region and by commodity group, 1996–97 to 2007–08
- Table: import values by region animal & vegetable oils, fats & waxes

- Table: import values by region beverages & tobacco
- Table: import values by region chemical & related products nes
- Table: import values by region commodities & transactions nes
- Table: import values by region crude mats, inedible, except fuels
- Table: import values by region—food & live animals
- Table: import values by region machinery & transport equipment
- Table: table import values by region-manufactured goods classified chiefly by materials
- Table: import values by region-mineral fuels, lubricants & related materials
- Table: import values by region miscellaneous manufactured articles