WORKSHOP BACKGROUND DOCUMENT

LIGHT RAIL

The catalyst for economic growth and development in the South West Metropolitan Region of Perth

INTRODUCTION

The State Government's twenty year infrastructure strategy largely centred on its METRONET vision to transform Perth's transport network to "connect our city, reinvigorate suburbs, cut congestion and create thousands of jobs in the process." In addition to heavy rail extensions, new stations and level crossing removal, "part of stage one will include planning work for an inner suburban light rail system".

The South West Group of Councils advocates light rail transit (LRT) as the catalyst for the economic and social development of the South West Metropolitan Region. Its role of linking key heavy rail stations along activity corridors, strengthening activity centres, facilitating greater use of public transport and reducing the traffic congestion and private car parking demand.

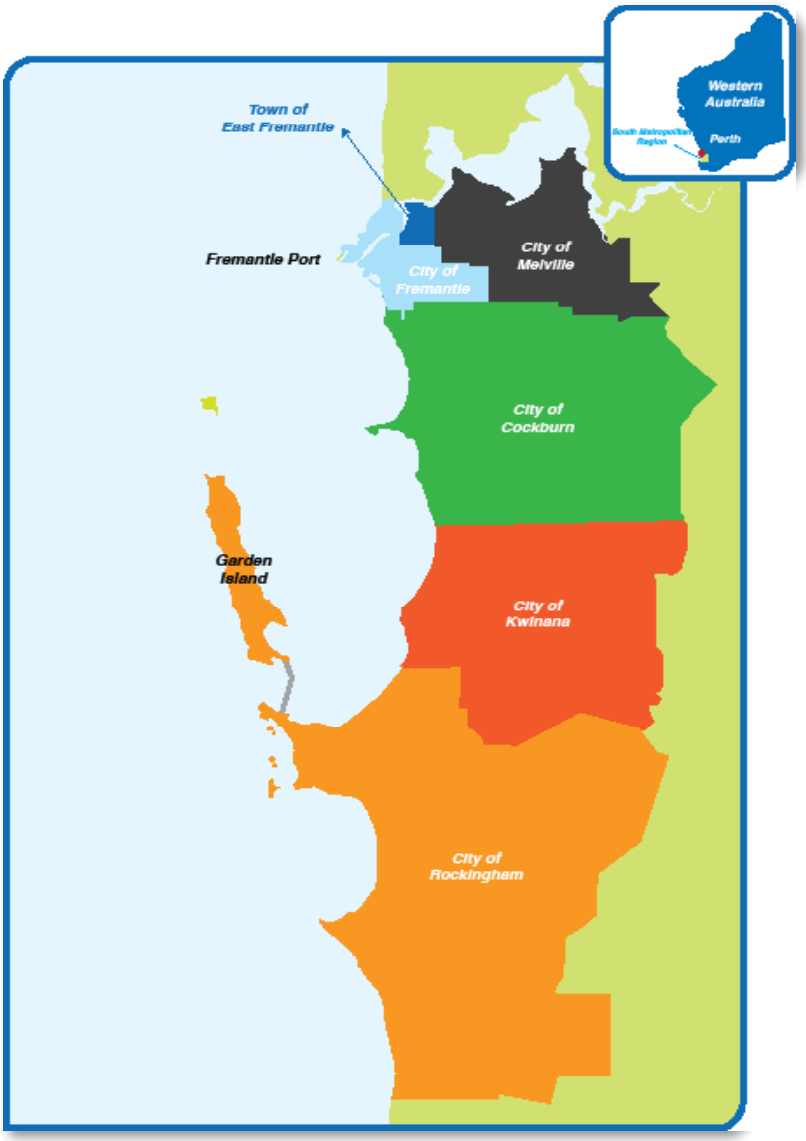
Role of the South West Group

The South West Group is a voluntary regional organisation of councils (VROC) comprised of the cities of Cockburn, Fremantle, Kwinana, Melville and Rockingham and the Town of East Fremantle.

The South West Group is committed to fulfilling its role and responsibility in support of framing and planning the State's 20 year infrastructure strategy with sustainable urban and regional development and has adopted specific policy goals:

- Sustainable, diverse and liveable communities for our growing population
- Economic gateway to WA as a provider of regional employment centres, and
- Efficient and optimised freight and logistics networks, supported by investment in infrastructure and services

The South West Group has compiled the following statistical summary of the elements impacting urban and regional development for the 2016 to 2036 timeframe to support the justification for introducing light rail into the region. A feature of these statistics is the consistent and substantial contribution the South West Metropolitan Region provides the Perth Metropolitan Region and the State of Western Australia.



2016 - 2036

20 YEAR INFRASTRUCTURE STRATEGY

SOUTH WEST GROUP

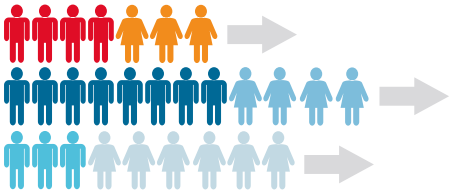
Population Growth and Distribution Across the South West Metropolitan Region

The South West Metropolitan Region has grown at a faster rate than Greater Perth for many years, with actual population growth rates exceeding State Government forecasts. Detailed analysis of potential growth conducted by ID, in partnership with Local Governments, has identified the most likely population growth and distribution across the South West Metropolitan Region shown in Table 1.

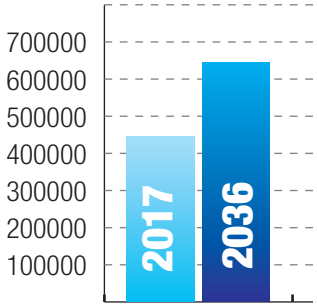
TABLE 1: SOUTH WEST METROPOLITAN REGION POPULATION GROWTH 2017-2036

LGA	2017 POPULATION	2036 POPULATION	PERCENTAGE GROWTH
Cockburn	116,529	171,760	47.40% ▲
East Fremantle	8,189	10,657	30.14% ▲
Fremantle	32,188	42,839	33.09% ▲
Kwinana	42,797	84,373	97.15% ▲
Melville	107,620	128,415	19.32% ▲
Rockingham	139,672	196,312	40.55% ▲
South West Region	446,996	634,356	41.92% ▲
SWG Proportion of Greater Perth	21.29%	21.82%	
Greater Perth	2,100,000	2,906,720	38.42% ▲

Source: Forecast ID and ID Placemaker



41.92%
POPULATION GROWTH



South West Region
POPULATION

Regional Income

Table 2 shows income received through wages and salaries for residents within member Councils across the South West Metropolitan Region, representing over 20% of that received in the Perth Metropolitan Region.

TABLE 2: SOUTH WEST METROPOLITAN REGION INCOME 2015 (EXC. GOVT PENSIONS AND ALLOWANCES)

LGA	INCOME $M
Cockburn	4,315.6
East Fremantle	458.8
Fremantle	1,482.8
Kwinana	1,210.1
Melville	5,284.8
Rockingham	4,761.8
South West Region	17,513.9
SWG Proportion of Greater Perth	20.82%
Greater Perth	84,127.6

20.82%
INCOME PROPORTION OF GREATER PERTH

Source: ABS Region Data Economy and Industry accessed October 11, 2017

Elements Impacting Urban and Regional Development

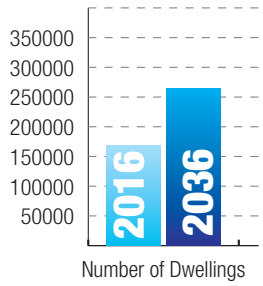
Dwelling Demand

Dwelling demand follows population growth and allowing for demographic trends in housing occupancy the number of dwellings in the South West Metropolitan Region is forecast to grow from 168,681 in 2016 to 250,741 in 2036 (Table 3). This equates to building 4,100 new dwellings a year.

TABLE 3: SOUTH WEST METROPOLITAN REGION DWELLING GROWTH

SOUTH WEST GROUP	NUMBER OF DWELLINGS
2016	168,681
2036	250,741

Source: Forecast ID



Employed Residents and Job Creation

A key driver of economic growth as well as congestion is the number of employed residents. In 2016 there were 211,834 employed residents in the region (Table 4) with only 170,792 local jobs available (Table 5) adding to the need for travel for employment.

TABLE 4: SOUTH WEST METROPOLITAN REGION EMPLOYED RESIDENTS

SOUTH WEST GROUP	NUMBER OF EMPLOYED RESIDENTS
2016	211,834

Source: NIEIR

TABLE 5: SOUTH WEST METROPOLITAN REGION JOBS

SOUTH WEST GROUP	NUMBER OF JOBS
2016	170,792

Source: NIEIR

The South West Group supports initiatives to lift local employment and is targeting 300,000 local jobs by 2036 to improve employment self-containment. This is 130,000 jobs over 20 years or 6,500 new jobs a year.

TABLE 6: EMPLOYMENT SELF SUFFICIENCY IN THE DIRECTIONS 2031 PLANNING REGIONS 2011

PLANNING REGION	RESIDENT WORKERS	JOBS IN REGION	EMPLOYMENT SELF SUFFICIENCY %	EMPLOYMENT SELF CONTAINMENT	JOURNEY TO WORK 2011 CENSUS FOR PERSONS TRAVELLING TO WORK		
					PUBLIC TRANSPORT PATRONAGE	CAR ONLY	WALK BICYCLE
Central	373,075	478,666	128.3%	76.3%	17.7%	75.4%	4.5%
South West	**107,114**	**65,505**	**61.2%**	**40.3%**	**3.2%**	**90.0%**	**2.8%**
South East	89,630	37,147	41.4%	27.7%	3.2%	89.9%	3.6%
North West	156,405	70,041	45.0%	35.3%	3.8%	90.0%	3.1%
North East	98,167	64,428	69.7%	37.0%	2.6%	91.1%	3.1%
Peel	34,716	24,581	70.8%	51.5%	3.8%	89.7%	3.5%
Total	859,107	740,368	86.2%				

Source: UDIA Employment Patterns Tool Using ABS 2011 Census Data

TABLE 7: 2016 CENSUS DATA ON JOURNEY TO WORK (INCLUDING THOSE WHO DID NOT TRAVEL)

TRAVEL MODE	COCKBURN	EAST FREMANTLE	FREMANTLE	KWINANA	MELVILLE	ROCKINGHAM	PERTH SOUTH WEST STATISTICAL AREA (SA4)
Car as Driver	67.0%	63.3%	56.5%	63.3%	64.3%	64.2%	64.3%
Car as Passenger	4.5%	3.4%	3.5%	4.8%	4.0%	4.9%	4.4%
Worked at Home	3.2%	7.3%	5.8%	2.4%	5.2%	4.3%	3.8%
Train Only	2.8%	0.0%	4.1%	5.8%	2.2%	2.2%	2.9%
Bus Only	2.4%	3.3%	3.5%	2.2%	4.0%	3.9%	3.0%
SUMMARY							
Public Transport	9.7%	8.3%	12.6%	13.6%	10.3%	9.2%	10.3%
Car	74.5%	68.5%	62.2%	71.4%	70.4%	70.4%	71.5%

Source: ABS 2016 Census Data

Tables 6 and 7 highlight the hazards of comparing journey to work data when Table 6 only includes percentages of those who actually travelled to work and Table 7 includes travel as a percentage of all employed.

Table 7 highlights the low car occupancy for journey to work with most vehicles being driver only. The City of Kwinana has the highest use of public transport for journey to work with 13.6% and Fremantle has the lowest car use at 62.2%.

TABLE 8: DETAIL OF TRAVEL TO WORK 2011 AND 2016 PERTH SOUTH WEST SA4

METHOD OF TRAVEL	2011	2016 % OF EMPLOYED	2016	GROWTH 2011-2016 (NO)	GROWTH 2011-2016 (%)
Tram/Train Only	4,773	5,545	2.95%	772	16.17%
Bus Only	5,104	5,565	2.96%	461	9.03%
Car Only as Driver or Passenger	115,861	129,226	68.73%	13,365	11.54%
Motorcycle or Scooter	978	864	0.46%	-112	-11.45%
Bicycle	1,694	1,770	0.94%	76	4.49%
Other Vehicle (i.e. Taxis)	2,412	2,664	1.42%	252	10.45%
Walked Only	3,477	3,179	1.69%	-298	-8.57%
Total One Method	135,662	150,124	79.84%	14,462	10.66%
Used More Than One Method	9,069	9,157	4.87%	88	0.97%
Worked From Home	5,716	7,171	3.81%	1,455	25.45%
Employed But Stayed Home	19,900	19,778	10.52%	-122	-0.61%
Other	2,328	1,791	0.95%	-537	-23.07%
Total Employed	172,675	188,023	100.00%	15,348	8.89%

Source: ABS 2016 Census

13,365
INCREASE IN CAR ONLY COMMUTE TO WORK

25.45%
WORKING FROM HOME

The final column of Table 7 and Table 8 are based on the Perth South West Statistical Area (SA4) which differs very slightly from the South West Metropolitan Region by including the small part of Leeming that is within the City of Canning.

Table 8 shows a strong growth in employment of 15,348 persons. The other main changes from the 2011 to 2016 Census are the significant percentage increase in working from home (25.45%) with the concerning 11.54% increase of 13,365 by journeys by car only. In Table 8, the 10.3% figure for journeys by public transport for South West Metropolitan Region journey to work equates to 19,366 public transport boardings. This compares to 134,436 journeys by car as a passenger or driver.

Table 8 shows a decline in active transport (walking and cycling) despite the strong increase in total employed. It may reflect the weather conditions evident at the time of the Census.

South West Metropolitan Region Journey To Work - 2016 Census Data

Journey to work data captured as part of the Census is one of the most significant inputs to transport planning. It is the most comprehensive assessment of a major component of congestion. Travel to and from work and travel for work typically makes up half of week day traffic. The balance is comprised of journeys for shopping, services, education, transporting others, social activity and for recreation.

The choice of where to live in relation to employment location is crucial in managing congestion as it is often the longest week day journey undertaken in peak traffic. Living location is typically constrained by housing affordability and housing availability but factors such as family education, amenity, access to services and access to recreation play significant roles. Technology allows for high productivity work from home but those working in this mode have to date been a small fraction of the workforce.

The transaction costs of moving to match employment and education locations are high and residents may travel long distances rather than change housing location.

The location of work may change due to the nature of the work.

The historical development of Perth has meant that many tradespersons live in locations that may have been close to building sites on which the person was employed a decade ago but now the rapid growth of the southern suburbs means a daily cross-town journey.

Many of the rapidly growing outer suburbs adjoining the South West Metropolitan Region have low levels of jobs (see Planning Regions outside Central Perth in Table 6) necessitating travel through the South West Metropolitan Region to employment locations. Public transport is poorly used for these east west journeys with a high proportion being made by car (see Figure 1).

FIGURE 1: GREATER PERTH GROWTH AREAS 2021 TO 2031

Source: Boomtown: How much and how fast is Perth Growing, .id, 2014

Average annual pop change
- Greater than 3.5% gain
- 1.5% to 3.5%
- 0.5% to 1.5%
- -0.5% to 0.5%
- -1.5% to -0.5%
- -1.5% to 3.5%
- Greater than 3.5% loss

Public Transport Patronage

The South West Metropolitan Region has some of Perth's busiest rail stations. Fremantle with 5,114 boardings is the busiest heritage line station outside the Perth CBD well ahead of Midland at 3,697 boardings. Murdoch and Cockburn Central are the busiest rail stations outside of the Perth CBD (see Table 9).

Public transport use in the South West Metropolitan Region and Greater Perth has plateaued on the Mandurah Line to just over 20 Million boardings since 2012/13 as shown in Table 10.

TABLE 9: BOARDINGS IN THE SOUTHERN WEST METROPOLITAN REGION AND ARMADLE LINE

LINE	STATION	BOARDINGS MARCH 2010	BOARDINGS MARCH 2014	BOARDINGS MARCH 2017
Fremantle (2 Stations are 2.8km apart)				
	Fremantle	4,496	5,372	5,114
	North Fremantle	403	557	678
Mandurah (10 Stations 63.7 km apart Average spacing 7.07km)				
	Canning Bridge	3,550	4,720	4,212
	Bull Creek	4,095	5,319	5,059
	Murdoch	6,733	8,949	9,063
	Cockburn Central	3,812	5,856	6,688
	Aubin Grove	-	-	Opened 23.4.2017
	Kwinana	1,365	2,118	2,147
	Wellard	741	1,377	1,960
	Rockingham	2,961	4,141	3,903
	Warnbro	2,464	3,524	3,584
	Mandurah	3,594	4,487	4,243

Source: PTA

TABLE 10: SOUTH WEST METROPOLITAN REGION - MANDURAH LINE BOARDINGS 2008 - 2017

YEAR	MANDURAH LINE BOARDINGS	ANNUAL INCREASE	MANDURAH LINE PERCENT OF TOTAL TRAIN BOARDINGS IN PERTH	COMMENT
2016/17	20,343,828	-1.22%	33.85%	Aubin Grove Station opened 23.4.17
2015/16	20,595,401	-0.50%	32.90%	
2014/15	20,699,900	+0.18%	33.37%	Peak share of boardings
2013/14	20,633,690	-2.30%	32.55%	
2012/13	21,648,000	+4.22%	32.20%	Peak annual boardings
2011/12	20,293,223	+9.58%	32.20%	
2010/11	18,519,864	+11.41%	31.46%	
2009/10	16,622,946	+3.53%	30.07%	
2008/09	16,056,732	+21.50%	29.89%	

Sources: Hansard September 27, 2011 pp7722-24 and TransPerth Patronage fromwww.pta.wa.gov.au

Vehicle Ownership and Traffic Generation

TABLE 11: SOUTH WEST METROPOLITAN REGION REGISTERED MOTOR VEHICLES 2013-2016

LGA	REGISTERED VEHICLES 2013	REGISTERED VEHICLES 2014	REGISTERED VEHICLES 2015	REGISTERED VEHICLES 2016	GROWTH IN REGISTERED VEHICLES 2013-2016
Cockburn	73,265	79,092	81,116	83,247	9,982
East Fremantle	5,633	5,829	5,975	5,995	362
Fremantle	24,640	25,781	26,388	26,591	1,951
Kwinana	24,611	26,036	27,564	28,776	4,165
Melville	80,976	83,226	83,720	83,805	2,829
Rockingham	86,025	92,379	96,240	98,357	12,332
South West Group	**295,150**	**312,343**	**321,003**	**326,771**	**31,621**
SWG Proportion of Greater Perth	19.37%	19.63%	19.84%	20.00%	29.74%
Greater Perth	1,523,835	1,590,767	1,618,217	1,633,868	110,033

Source: ABS Region Data Economy and Industry accessed October 11, 2017
Data is at January 1 for each year

Future traffic generation is linked to the number of registered motor vehicles. Table 11 shows stronger growth in registered vehicles in the South West Metropolitan Region than for Greater Perth. Table 12 shows that light commercial vehicles and light rigid trucks have had stronger growth than passenger vehicles for Greater Perth and that there have been an extra 110,033 vehicles registered between 2013 and 2016.

It would be expected that with the emphasis on improved public transport and the growth of population that there would be a significant increase in the number of buses, however Table 12 shows that passenger vehicles growth at 6.65% is much greater than bus growth of 3.69% from 2013 to 2016 in the Greater Perth area.

TABLE 12: GREATER PERTH TYPE OF REGISTERED MOTOR VEHICLES 2013-2016

VEHICLE TYPE	REGISTERED VEHICLES 2013	REGISTERED VEHICLES 2014	REGISTERED VEHICLES 2015	REGISTERED VEHICLES 2016	GROWTH IN REGISTERED VEHICLES 2013-2016	PERCENT GROWTH 2013-2016
Passenger Vehicle	1,159,078	1,205,885	1,233,866	1,236,127	77,049	6.65%
Campervan	4,978	4,942	4,958	4,987	9	0.18%
Light Commercial	220,558	231,364	237,094	239,707	19,149	8.68%
Light Rigid Trucks	10,764	11,566	11,775	12,170	1,406	13.06%
Heavy Rigid Trucks	28,638	29,910	30,307	30,157	1,519	5.30%
Articulated Trucks	7,582	8,073	8,289	7,991	409	5.39%
Non Freight Trucks	2,884	2,977	3,069	3,107	223	7.73%
Buses	9,810	10,078	10,200	10,172	362	3.69%
Motorcycles	79,543	85,972	88,659	89,540	9,997	12.57%
Greater Perth Total	1,523,835	1,590,767	1,618,217	1,633,958	110,033	7.22%

Source: ABS Region Data Economy and Industry accessed October 19, 2017
Data is at January 1 for each year

Estimating Congestion Costs and Vehicle Travel in the South West Metropolitan Region

Traffic in Australia's Capital Cities is calculated primarily based on fuel sales linked to vehicle fuel economy. Information is not available at a local government or regional level. Congestion is linked to traffic, investment in roads and public transport, economic activity, employment and disposable income. BITRE in Information Sheet 74 estimates that Perth's lower baseline of avoidable social cost of congestion in 2016 was $2.15 Billion climbing to $4.37 Billion in 2030.

Future traffic and congestion assessments need to assume how demographic and economic change will influence transport choices into the future.

Perth is a very car dependent city.

BITRE in Report 142 identified that 78% of commuter journeys in Perth were by private vehicle. A commonly used link between population and travel is that each person in Perth undertakes 3.5 trips per day. BITRE in Report 127 estimated that traffic generated by each person in Perth is 10,000 vehicle kilometres travelled per year. This figure has plateaued.

The impact of population growth between 2017 and 2036 in the South West Metropolitan Region of 187,360 persons would equate to an extra 655,760 trips per day and an extra 1,873.6 million vehicle kilometres a year, if current resident behaviour was continued.

In estimating the proportion of Greater Perth's congestion costs applicable to the South West Metropolitan Region, it should be noted that the BITRE71 approach was to assess GDP per person and assign a freight task per capita. Car travel per person was linked to income per person. So, population is a relevant and simple way to calculate a proportion. Adding registered motor vehicles and a proxy for economic activity (building approvals) also seems appropriate.

TABLE 13: ESTIMATES OF ANNUAL CONGESTION COST FOR THE SOUTH WEST METROPOLITAN REGION

INDICATOR	SOUTH WEST METROPOLITAN REGION	GREATER PERTH	FRACTION OF $2.15 BILLION	CONGESTION COST FOR SOUTH WEST METROPOLITAN REGION $M
Registered Motor Vehicles January 1 2016	326,771	1,633,868	0.2000	$430.0m
Population June 30 2015	425,514	2 066 136	0.2059	$442.7m
Value Residential Building Approvals 2016/17 Year	$1,690.4m	$8,589.0m	0.1968	$423.1m
Income 2015 (Excluding Government Pensions and Allowances)	$17,513.9m	$84,127.6m	0.2082	$447.6m
Average			0.2027	$435.9m

Sources: ABS Region Data, ABS 8731.0 and ABS 3218.0

Table 13 shows several approaches to develop an estimate of congestion cost for the South West Metropolitan Region linked to the $2.15 Billion cost for Perth. They all produce an annual avoidable cost of congestion for the South Metropolitan Region of over $420 million for 2016.

BITRE estimate that Perth's cost of congestion will reach $4.37 Billion in 2030. This figure projected forward gives $4.95 Billion in 2036, which equates to a congestion cost for the South West Metropolitan Region in 2036 of $1.04 Billion.

BITRE in Information Sheet 74 estimates that Vehicle Kilometres Travelled (VKT) in Perth will be 18.21 Billion in 2016 and 27.62 Billion in 2030. Projecting the VKT forward to 2036 gives a Perth VKT figure of 31.12 Billion.

A similar approach to that used to calculate congestion for the South West Metropolitan Region can be applied to VKT. Assuming the fraction of 0.20 this gives South West Metropolitan Region VKT as 3.64 Billion for 2016 and 6.22 Billion for 2036.

Freight Task

The recently released Shifting the Dial Report stated that:

"The overall freight task in Australia is projected to increase by 26 per cent within a decade from 2015, and 86 per cent by 2031, much of which will comprise deliveries utilising roads within capital cities".

Similar growth is expected in the South West Metropolitan Region.

TABLE 14: SOUTH WEST METROPOLITAN REGION - FREMANTLE PORT STATISTICS

ACTIVITY	2012/13	2013/14	2014/15	2015/16	2016/17
Ships (non-Naval) No.	2,151	2,277	2,110	2,021	1,868
Gross Tonnage of Ships (non-Naval) ,000 tonnes	64,432.6	66,437.3	65,340.4	69,244.2	71,011.7
Ships (Naval)	7	35	45	62	92
Containers Handled TEU	670,282	703,327	743,495	715,107	715,949
Rail Share of Containers %	13.7%	14.2%	13.2%	14.7%	15.0%
Total Port Trade ,000 tonnes	31,980	33,506	35,842	34,823	35,249

Source: Fremantle Ports 2017 Annual Report and WA Port Operations Taskforce Minutes

The 715,949 TEUs of containers handled in 2016/17 through the Port of Fremantle were similar to the 2015/16 volume and below the peak in 2014/15 (see Table 14).

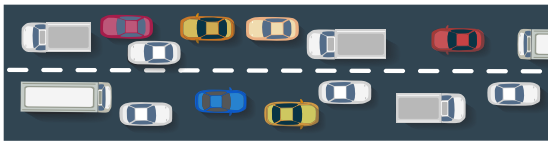
Community Policy Objectives

The statistical information and economic factors above have major implications for the way that people and goods move throughout the region and need to be considered in the context of community policy objectives for the region.

- **Accommodate population growth**
  - Increase residential densities
  - Zone adequate commercial/industrial land for job creation

- **Contain urban (geographic) expansion**
  - Integrated planning and best use of existing infrastructure
  - Greater use of technology applications

- **Improve urban amenity**
  - Consolidate and link activity, educational and employment centres
  - Increase residential density on activity corridors and at mixed use nodal locations



- **Reduce traffic congestion**
  - Greater use of public transport – convenient, direct and reliable travel
  - Reduce journey to work travel distances

Light Rail Transit - The Catalyst in Support of Community Policy Objectives

Light Rail is a crucial part of managing congestion in the South West Metropolitan Region which is expected to grow its housing stock by 4,100 dwellings per year for the next 20 years to cater for the projected annual population growth of over 10,000 persons.

It is a key element of moving away from a car dependant city where 78% of commuter journeys are currently undertaken by private vehicle (BITRE 142).

Perth traffic is estimated to increase to 31.82 billion Vehicle Kilometres travelled by 2036 if public transport patronage remains at current proportions of commuter journeys.

It will also facilitate jobs growth by stimulating investment in urban nodes and activity centres to provide 6,500 jobs a year required to support population growth and improve employment self-sufficiency.

Even with dramatically improved public transport, the annual avoidable cost of congestion in the South West Metropolitan Region is expected to reach over $1 billion by 2036.

The region is unique in the Perth Metropolitan Region in having heavy industry and a major container port serviced by transport corridors through dense urban development. Whilst current container trade has plateaued at 715,949 TEU for 2016/17, it is expected that this will return to a strong growth path as economic development activity picks up and therefore placing further pressure on congestion.

Light rail provides a lower cost form of mass transit public transport that has the ability to be a catalyst for economic growth and development (higher density residential, commercial, retail, entertainment, food and beverage) along the light rail route and at key stops (development nodes).

Resources:

Hon Rita Saffioti BBus MLA, Minister for Transport; Planning; Lands, Specialist team to drive METRONET vision, Media Statement, 28 May 2017.

https://www.mediastatements.wa.gov.au/Pages/McGowan/2017/05/Specialist-team-to-drive-METRONET-vision.aspx/

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