Impact Ecofin Australia

The Economic Impacts (Multiplier Approach) of the Readymix Regional Distribution Centre at RootyHill, Blacktown.

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Contents

Disclaimer

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Executive Summary

Key Points

- Readymix proposes to develop land off Kellogg Road at Rooty Hill in the Local Government Area (LGA) of Blacktown for the purpose of a Regional Distribution Centre (RDC) consisting of a concrete batching plant, transfer depot, administration offices laboratory and associated facilities.

- The purpose of this economic impact analysis (EIA) is to provide an economic assessment of both the direct and indirect effects relating to the proposed RDC on the local and regional economy.

- The economic impacts of the proposed Readymix RDC are measured in terms of employment, output, income and value added. Multipliers generated from the identification of the linkages across the local economy (Rooty Hill and surrounding areas) are subsequently used to predict the economic flow-on effects of the RDC on the local economy.

- The Readymix RDC will generate additional 230 - 270 full time jobs for the Blacktown LGA. The expectation is that when the RDC is fully operational that some 50% of these workers will be residents of Greater Western Sydney. The current Readymix operation at the Humes Plant, RootyHill employs approximately100 workers of which 60% are residents of the Blacktown LGA

- Calculating a 'local multiplier' for Blacktown, this EIA discovered that based on a conservative annual income paid to its workers the Readymix RDC project will indirectly generate a total of $5.3 million for local businesses per annum when fully operational.

- Employing a statistical technique termed the location quotient (LQ) this study found that Readymix's proposed RDC activities will bring about an additional net increase of approximately 156 jobs to the export employment capacity for manufacturing based on Readymix's planned employment for the RDC.

- Based on an analysis of the proportion of employment involved in basic activities relative to non-basic activities this study generated an employment multiplier for Blacktown of 2.4 implying that for every new job created in Blacktown an additional 2.4 jobs are generated across all industries in Blacktown this would include service (non-basic) activities and other basic activities apart from manufacturing. Across the GWS regional economy the dependency of non-basic

activity upon basic activity is evident by the fact that employment and profitability in service [non-basic] activities is highly sensitive to changes in basic activities (Andrews, 1960, p.6).

- The impact of increased employment and economic activity associated with both the construction and operation phase of the RDC would be felt by a wide range of businesses in the community, principally retail outlets and service firms such as tradespeople, repair shops and food outlets.

- Readymix estimates that the net number of potential new positions created by the RDC operation at RootyHill at approximately 60 people.

- During the construction phase of the RDC it is expected that a total of approximately 220 persons will be employed over the course of the project with a peak of 150 at any one time. The study has found that over the construction phase; Readymix-related direct expenditures will amount to between $80-110 million of which wages and salaries will account for around 35%. The construction phase will take approximately two years.

- It is estimated that for each dollar of value-added created in local manufacturing approximately $5 to $7 dollars is spent in industries that directly support manufacturing (Agrawal, 2000). Additionally, for every 1 million dollars of manufacturing activity retained in a region approximately 18 jobs are created (ISO 2001).

- Without the RootyHill RDC (4Mtpa) development Readymix would receive all their quarry raw materials by road from outside the metropolitan area. This would see an increase in truck kilometres travelled both within and outside the metropolitan area. In contrast the proposed project would see the bulk of raw materials brought to the RDC by rail from outside the Sydney Basin. This will require fewer trucks travelling within the metropolitan area and a reduction in longer distance haul.

- In the absence of stated dollar values related to the impact of traffic changes associated with the construction of the RDC the alternative was to examine changes to the Level of Service (LoS) on the roads surrounding the proposed RDC. Subject to the installation of the recommended two lane roundabout at the intersection of Kellogg Road and Woodstock Avenue, the analysis undertaken demonstrates that the road network could accommodate traffic generated by the proposed RDC and will not result in adverse traffic conditions from a safety or performance perspective.

- During the operation of the RDC the expected traffic generated from the RDC site will be minor in comparison to the volume of traffic handled by the M7 and will therefore have negligible impacts on the performance of the motorway. The location of the RDC adjacent to the M7 allows heavy vehicles to travel short distances to access the motorway therefore avoiding adding to the congestion on the surrounding roadways.

- The conclusion of the air quality assessment is that air quality impacts would be at acceptable levels and that air quality goals would not be exceeded at sensitive locations due to the operation of the plant at full capacity of 4 Mtpa.

- Overall the impact of the RDC (4Mtpa) locating at the RootyHill site will not significantly affect the aquatic ecology values of Angus Creek given that the recommendations in the Aquatic Assessment are implemented.

- The Noise study found noise levels not to exceed the recommended maximum noise amenity level in the surrounding residential areas of the proposed RDC. In addition the operation of the proposed RDC during the night-time period is also predicted to meet the recommended sleep disturbance noise goal. In conclusion there is no measurable increase in noise which would amount to an increase in costs due to sleep disturbance or nuisance form increased noise associated with the RDC proposal

- Given that the flood model indicates there to be no incremental increase in flood damages in – the 100 year ARI flood event there are neither quantifiable or unquantifiable costs associated with the RDC proposal locating at RootyHill

- The landscape master plan addresses the effects of the RDC by upgrading the visual aspects within the site area, including the provision for tree and shrub planting and turfed areas. Implementing these recommendations will clearly incur a cost on behalf of the proponent of the project, however the benefit of such undertakings will overall nullify the visual affects of the project to surrounding residential areas.

I Introduction

Impact Ecofin Australia (IEA) has been commissioned by Readymix Holdings Pty to conduct an economic impact study for the proposed Regional Distribution Centre (RDC) to be developed at RootyHill in the Blacktown LGA. The methodology employed in this study involves two broad approaches. Initially a Multiplier Approach is used to investigate the economic linkages between the proposed development and the Blacktown local government area and the surrounding regional economy. In addition a second approach provides a benefit cost analysis of the Regional Distribution Centre.

Aims and Objectives

The aims of this study are:

Firstly, to understand the receiving environments current economic structure in terms of population, employment profile, industrial structure and gross regional output. In addition the study develops forecasts of the future size of these economies.

Secondly, establish estimates of the economic activity generated by the RDC by establishing employment multipliers with respect to the impact of the RDC and determining the amount of money flowing through the RDC, which is spent within the study regions.

Thirdly, by comparing the information on the RDC employment and money flows with data for the study regions, determine the contribution that the RDC will make to the surrounding regions. The methodology includes the application of multipliers to ensure that both the direct and flow-on impacts of RDC money flows and employment are taken into account.

Fourthly, by making some assumptions about the level of future economic activity in the study regions, make some estimates of the importance of basic employment generating operations such as the RDC to these regional economies in the future.

Economic Impact Studies

Economic impact studies describe the effects new projects have on the economic and social conditions in a given community or region. At the community level, an awareness of socio-economic effects is important so that local planners are aware of potential changes likely to arise in a community as a consequence of a new development. At the regional level, an assessment of the socio-economic impacts provides stakeholders with information, which can be used to weigh the potential positive and negative externalities including the net effects.

Typically new development projects will have associated economic externalities including changes in employment and associated earnings, net effects on revenues of

businesses at the local and regional level. Many externalities have both a social and an economic component such as population and demographics, cost of living, opportunities for local or regional business, and income distribution. Effects may arise from the project itself or in combination with other developments.

The purpose of this economic impact analysis (EIA) is to provide an in-depth analysis, into the nature of the direct and indirect economic effects of the proposed Readymix's Rooty Hill Regional Distribution Centre on the communities of the Blacktown local government area and the Greater Western Sydney's regional economy. The analysis is purely objective providing an assessment of the economic impacts associated with the RDC proposal at RootyHill, taking account of both the direct and indirect effects relating to the initial construction, and the ongoing effects of the RDC operation in the future.

Multiplier approach

Multipliers measure the relationship between direct economic impacts and the total economic impacts of an investment project on the local economy. Community economic impact analysis can be used to identify the economic significance of particular activities to a defined local and/or regional economy. In this case, the impact is generally measured in terms of criteria such as employment, output and income. Multipliers generated from the identification of the linkages across an economy (Blacktown and surrounding areas) will be used to predict the flow-on significance of the RDC activities on the local economy and the Greater Western Sydney regional economy. As such the direct and indirect impacts considered in this analysis are essentially concerned with expenditures and incomes in the economy or community.

Benefit-cost analysis

Benefit-cost analysis (BCA) examines whether a project/investment constitutes an efficient use of resources from the point of view of society as a whole. This BCA will take into account costs and benefits which may not be reflected in monetary transactions (for example the value to the public of travel time savings from a new road). While this economic appraisal will assess the costs and benefits associated with the proposed Regional Distribution Centre at RootyHill, the overall objective of the report is to show that the economic appraisal takes into consideration cost and benefits from the overall community perspective.

II Snapshot of the Regional Economies

The Local Government Areas which form the regional economy subject to this study are Blacktown and the adjacent local government areas located within Greater Western Sydney (GWS). The following map of GWS region illustrates their locations.

In 2001 the Blacktown LGA had a resident population of over 280,000 people. Since 2001 approximately 5,300 new residents per annum are calling Blacktown home. Between the last two census periods 24,145 new residents called Blacktown home – the second largest growth of any NSW LGA. Since World War II the population of Blacktown has been growing by approximately 100,000 residents every 20 years, with this trend expected to be exceeded over the next 20. As shown in Table 1 Blacktown City is set to experience significant population growth over the next 18 years. Within the study region, only the Liverpool LGA is expected to have a similar net increase in residential population, albeit from a significantly smaller base.

Greater Western Sydney is comprised of 14 Local Government Areas which together have a combined population of 1.7 million making the region the fastest growing in Australia. More than 150 of Australia's top 500 companies are located within the Greater West, while industries including advanced manufacturing, tourism, information technology, business services and retail trade are growing at much faster rates than the national average.

Blacktown Economic Indicators

- The estimated residential population of the City is 290, 691 (2003)
- Blacktown City is home to 1 in 74 Australians and is NSW's most populous LGA
- Projected population growth is higher for Blacktown City than for Sydney over projected periods shown
- The City's past and medium term future population growth are significantly above that for the Sydney metropolitan area
- Approximately 5,300 new people per annum are calling Blacktown City home
- Between the last two Census periods 24,145 new residents called Blacktown City home – the second largest growth of any NSW LGA
- The median age of residents is 31 compared to 34 for the SMA (2001)
- 2.4% of all residents are of ATSI descent compared to 1% for the SMA
- South Eastern and Central Asian communities grew the most significantly between the last two Census periods
- 29% of Blacktown City residents speak a language other than English
- Since World War II Blacktown City's population has been growing by approximately 100,000 residents every 20 years, with this trend expected to be exceeded over the next 20.

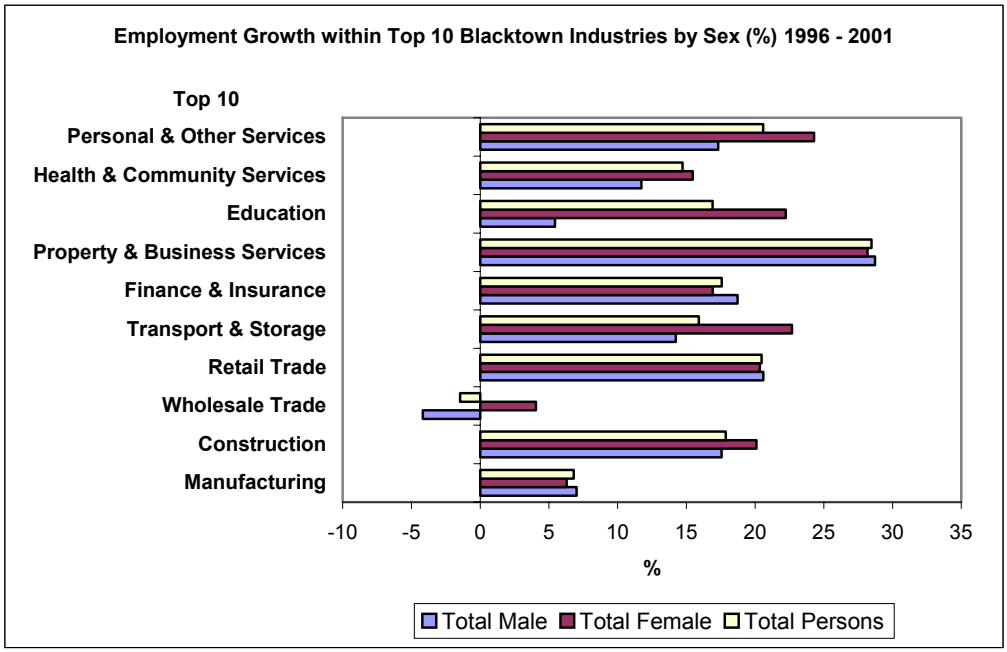
Labour Market Profile

In 2001 some 71,000 people worked in Blacktown of which 32,280 were residents from the Blacktown local government area, in percentage terms this means that some 45% of Blacktown's working population is comprised of local residents. For the people who work in Blacktown City, 69% of them work full time. This percentage is slightly higher than the full time employment figure for Greater Western Sydney. The largest employment sectors for Blacktown residents are manufacturing employing some 17% of Blacktown residents, retail trade 14% and property/business services accounting for 10% of the working population as shown in the graph below.

Employment Growth

An examination of employment growth rates in Figure 1 indicates that over the period 1996-2001 employment growth is concentrated in property and business services 30%, personal and other services (20.6%), retail trade (20.47%), construction (17.86%), and finance and insurance (17.6%). By contrast the manufacturing sector employed 17.21% of total employment in Blacktown but experienced only 6.8% growth while wholesale trade showed a decline in total employment of 1.5%.

Figure 1: Employment Growth 1996 - 2001



Historically, rates of labour force unemployment in Blacktown have been above those compared to metropolitan, State and national averages. However this trend, as shown by a variety of data, has changed considerably over the past two decades.

Employed residents	1986	1991	1996	2001
	75,756	85,495	96,737	108,880

Source: ABS Census of Population and Housing. 2001

	1986	1991	1996	2001	2002*
Unemployment	11.4%	13.2%	9.1%	7.7%	6.3%
Participation		63.9%	66.3%	67.7%	68.7%

Source: ABS Census of Population and Housing. 2001, *DEWRSB

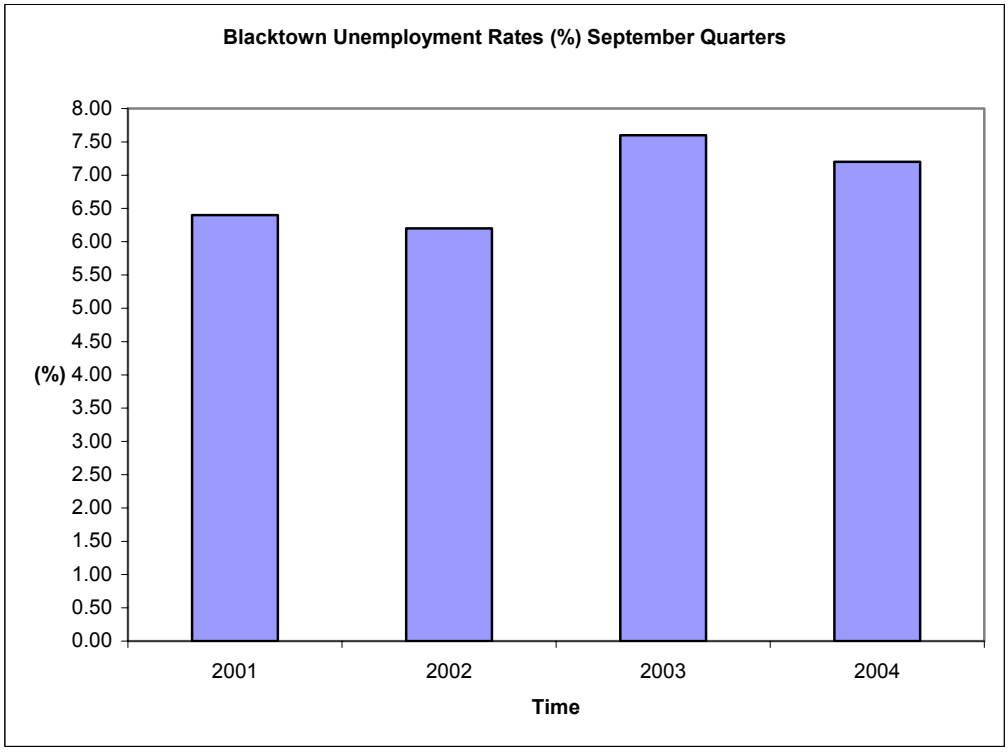
As shown above, both unemployment and participation rates among Blacktown residents have improved considerably since 1986. In addition to census data, more recent monthly ABS labour force data indicates that the trend in local unemployment has been one of consistent decline over the past two years. This general downward trend is also reflected in longer-term time series data displaying a convergent trend between Blacktown City and metropolitan unemployment levels. In 2001 Blacktown City had a labour force of 117,930. Of these, 108,880 were employed and the remainder, 9,053 were actively seeking employment.

Age and Employment Status of Workforce

Workers between the ages of 25-34 and 35-44 represent the largest percentage of the employed labour force comprised of 26% and 25% respectively as shown in Figure 2. Both these age groups also represent the largest percentage in full-time, part-time, and total employment with an average of 26%, 23.5% and 26% respectively. The same age groups also represent the first and second largest age group by unemployed but actively seeking full time employment.

The aggregate September 2004 quarter unemployment rate as indicated in Figure 2 for Blacktown was 7.2% a slight reduction from the 7.6% recorded for the previous September 2003 quarter. While the reduction in the general unemployment rate was welcome, comparatively these rates were 0.8% and 1.0% above the 2001 and 2002 September unemployment rates.

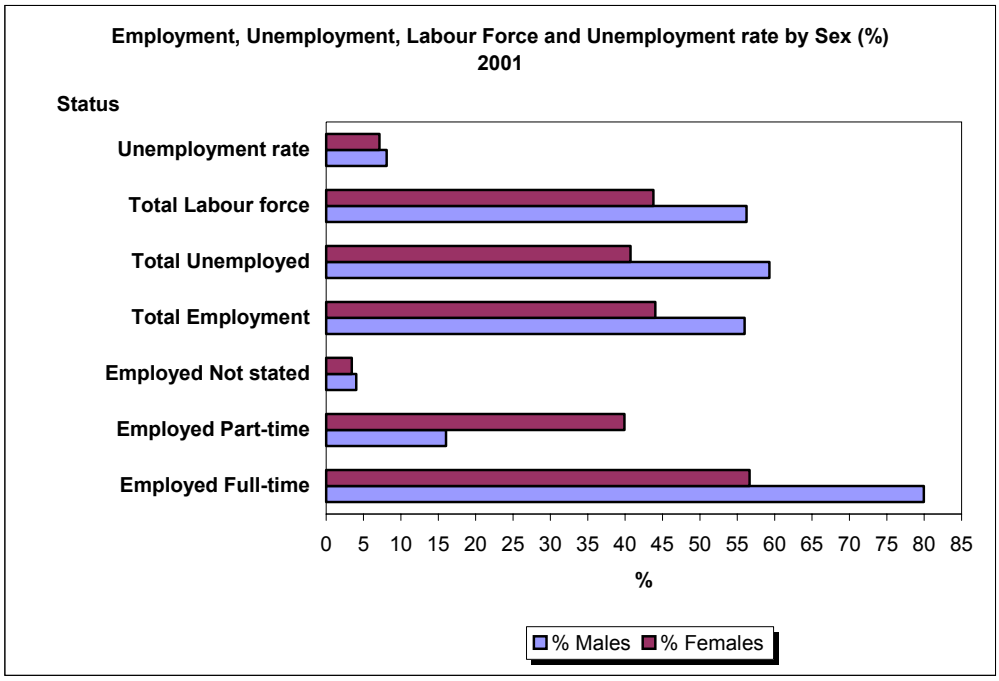
Figure 2 Unemployment Rates 2001 - 2004



Source: ABS Community Profile Census 2001

As of 2001, unemployment rates by sex showed that the unemployment rate among males and females to be 8.09% and 7.14% respectively [Figure 3]. Comparatively, more males have been employed on a full-time basis than females while females are predominantly employed on a part-time basis. Interestingly, males have accounted for 56%, 59% and 56% of the total labour force, unemployed, and employed respectively whereas females have accounted for 44%, 41% and 44% respectively. While female unemployment rates are lower than the male counter-part, males represent 12% more in the total labour force.

Figure 3: Blacktown Labour Force Status



Source: ABS Community Profile Census 2001

Table 1: Occupational Status Blacktown and Sydney

	Blacktown City	Sydney
Managers & Administrators	5.0%	9.0%
Professionals	12.7%	21.1%
Associate Professionals	9.5%	11.8%
Tradespersons & Related Workers	13.4%	11.1%
Advanced Clerical & Service Workers	3.7%	4.5%
Intermediate Clerical, Sales & Service Workers	20.0%	17.2%
Intermediate Production & Transport Workers	13.2%	7.4%
Elementary Clerical, Sales & Service Workers	10.3%	9.1%
Labourers & Related Workers	9.9%	6.6%
Miscellaneous	0.9%	1.2%
Total Numbers	108,880	100%

Source: ABS Census of Population and Housing, 2001

Occupations

Of Blacktown's employed residents, the majority are employed as intermediate clerical and service workers (20%) followed by tradespersons and related workers (13.4%) and then intermediate production and transport workers (13.2%). A striking difference between occupations of local residents and Sydney residents is the high proportion of intermediate production and transport workers.

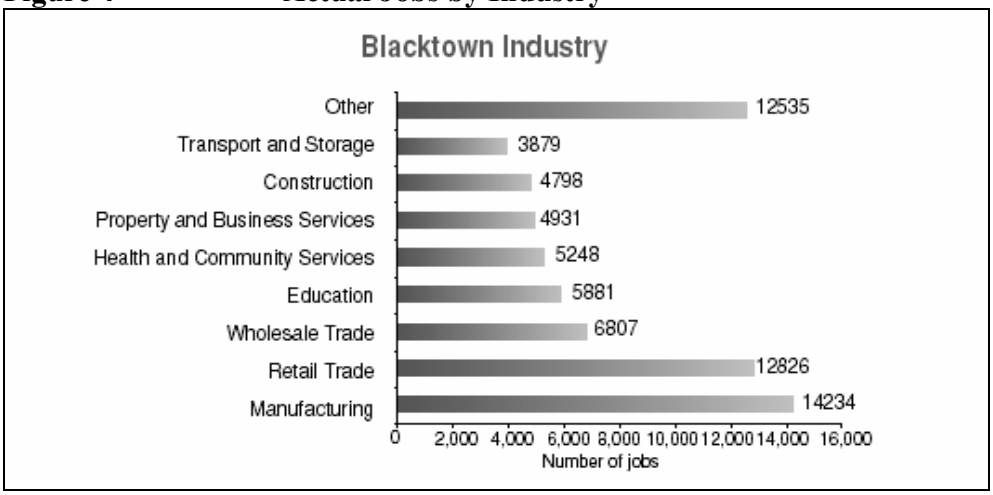
Table 2: Incomes Blacktown and Sydney

	Individual Income		Household Income	
Range ($)	Blacktown City %	Sydney %	Blacktown City %	Sydney %
Negative	7.7	7.2	0.6	0.8
1 - 159	11.1	9.8	3.4	3.4
160 – 199	8.6	7.3	3.4	3.4
200 - 299	10.1	10.2	5.4	6.0
300 – 399	7.6	7.1	7.6	6.7
400 – 499	8.2	7.3	5.7	5.7
500 – 599	8.7	7.3	4.7	4.4
600 - 699	7.3	6.1	5.5	5.0
700 - 799	6.0	5.4	4.7	4.2
800 - 999	7.4	7.4	10.0	8.4
1K - 1499	6.6	8.6	19.3	16.7
1.5K or more	2.0	6.1	21.0	27.1
Not stated	8.5	8.6	12.0	11.7
Total	100	100	100	100

Source: ABS Census of Population and Housing 2001

As shown in Table 2 Blacktown's individual and household incomes levels (pre tax and housing costs), have proportionally more residents in most income ranges below $800 - $999 per week.

Figure 4 Actual Jobs by Industry



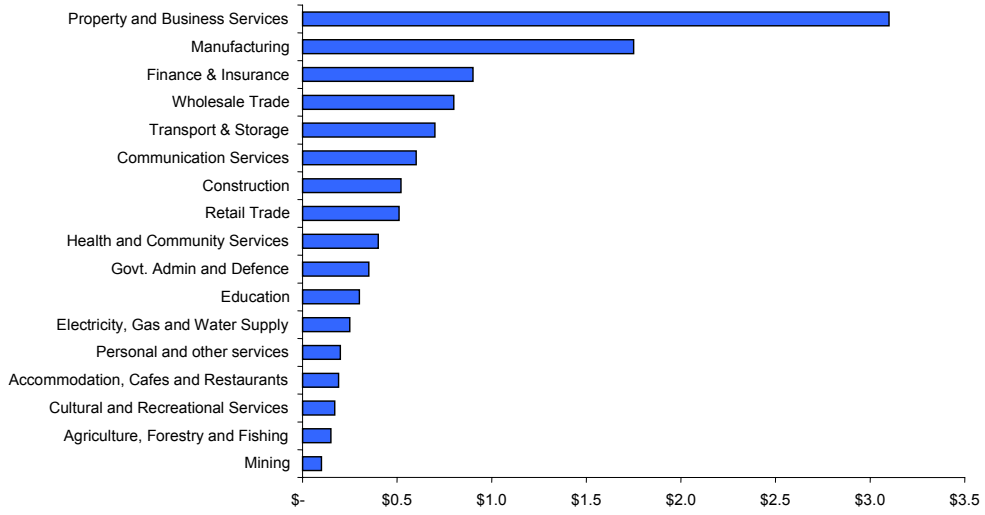
Source: ABS Community Profile Census 2001

In 2001, Blacktown City had a workforce of just over 71,000 people. The majority of employment was in the industries of Manufacturing (20%), Retail Trade (18%), Wholesale Trade (9.6%) and Education (8.3%). Health and Community Services, Property and Business Services and Construction were the next most popular industries.

Gross Regional Product

The estimated value of direct Gross Regional Product (GRP) for Blacktown City in 2002 was $10.8 billion. Industry GRP as measured by the total of direct gross value added, indicates that property and business services, followed by manufacturing finance and insurance, wholesale trade and transport & storage contribute the most to all value added created in Blacktown City.

Figure 6: Blacktown Gross Regional Product

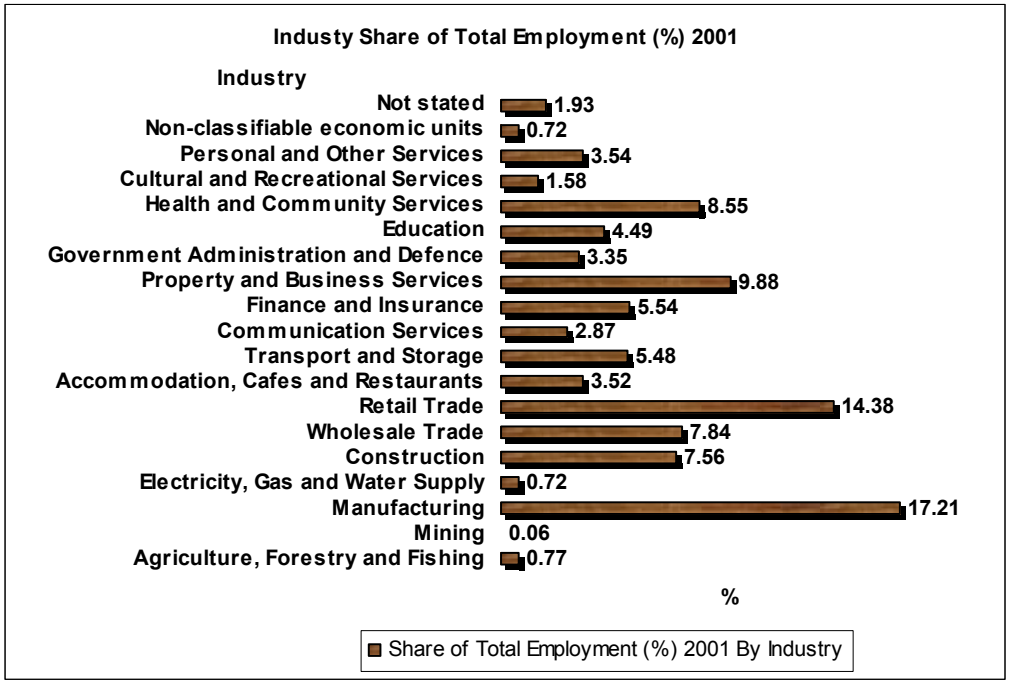


Graph derived from ABS Input-Output tables (all estimates use 1996/97 constant prices)

Manufacturing

Blacktown has approximately 1,800 manufacturers operating within its local Government boundaries. Of these, iron and steel manufacturing & fabrication, industrial machinery and equipment manufacturing, prefabricated building material and non-metallic product manufacturing (including rubber, plastic, glass and ceramic products) have the largest concentrations of employment. Food & beverage manufacturers are also highly significant employers.

Figure 7



Source: ABS 2001 Census compiled by Impact Ecofin

In terms of value, the manufacturing sector directly contributed almost $2 billion to economic activity of Blacktown City during 2002 / 2003. It is estimated that for each dollar of value-added created in local manufacturing approximately $5 to $7 dollars is spent in industries that directly support manufacturing (Agrawal, 2000). Additionally, for every 1 million dollars of manufacturing activity retained in a region approximately 18 jobs are created (ISO 2001).

Employment self sufficiency

Reaching or moving towards regional employment 'self sufficiency' by increasing the proportion of local jobs to local residents is one of the primary objectives of both the Blacktown Economic Development Strategy and the Greater Western Sydney Economic Development Board. In this regard, it is interesting to compare how Blacktown is positioned compared to neighboring LGA's across Greater Western Sydney. In (2001) the ratio of jobs to labour force in Blacktown was 65.34%, that is, from the City's 108,877 employed residents there were 71,190 jobs actually located within the Blacktown City. By comparison the regional economy of Greater Western Sydney maintained a ratio of jobs to labour force of approximately 60%.

Between 1981 and 2001 employment growth in Blacktown increased by 30,240 or 74%. Data in Table 3 suggests that Blacktown's largest employing industries are manufacturing (14,281) and retail trade (12,806) where the available stock of jobs locally were (20.1%) and (18%) respectively marginally higher than the corresponding figures for Greater Western Sydney. Overall there appears to be little disparity between Blacktown and the GWS regional economy in terms of the distribution of employment across industrial sectors.

However regional comparisons of the rate of local jobs held by local residents are problematic given differences in the spatial distribution of employment center's, urban areas and transport infrastructure across Sydney. Caution is required in interpreting aggregate data in respect of comparing local jobs available with employment of residents for a given region in that the matching of available jobs locally and the skills of the resident working population may not be closely correlated. Only when a disaggregate picture of available jobs broken down by skills or even industry and then compared to the skills of the resident labour force will a meaningful picture of correlations between local jobs and the skills of the resident labour force be a meaningful exercise.

Table 3 Jobs stock by industry (2001)

	Number	(% of total Blacktown)	% of total GWS
Agriculture, Forestry and Fishing	486	0.7%	1.0%
Mining	43	0.1%	0.1%
Manufacturing	14,281	20.1%	19.3%
Electricity, Gas & Water Supply	1,394	2.0%	0.7%
Construction	4,800	6.7%	6.1%
Wholesale Trade	6,815	9.6%	8.1%
Retail Trade	12,806	18.0%	16.0%
Accommodation, Cafes & Rest.	1,960	2.8%	3.7%
Transport & Storage	3,837	5.4%	4.3%
Communication Services	992	1.4%	1.6%
Finance & Insurance	1,247	1.8%	3.0%
Property & Business Services	4,915	6.9%	8.7%
Govt. Admin. & Defense	2,131	3.0%	3.8%
Education	5,865	8.2%	6.4%
Health & Community Services	5,295	7.4%	10.8%
Cultural & Recreational Services	1,196	1.7%	1.8%
Personal & Other Services	2,375	3.3%	3.7%
Total job stock	**71,190**	**100%**	**100%**

Source: NSW Transport Data Centre, based on ABS Census, 2001

Forecasts of employment self sufficiency: jobs target

Table 4 below provides projections through to 2026 for Blacktown's population, labour force, local jobs target and jobs/workforce ratio. While the actual population and labour force numbers are forecast to grow over the next twenty years the rate of change for the labour force (and population) declines appreciably over the forecast period. By comparison the local jobs target and the jobs/workforce ratio are projected to increase significantly over the period as shown below. These projected future local job targets (and jobs/workforce ratios) are based on the premise that new employment lands running parallel to the Westlink/M7 orbital currently under construction along with a consolidation of employment numbers in existing employment precincts will deliver the promised growth in jobs. The goal of the Blacktown Economic Development Strategy is to enhance the generation of sustainable employment opportunities for local workers within employment centers.

Table 4 Population, labour force and workforce growth, 1991 – 2026

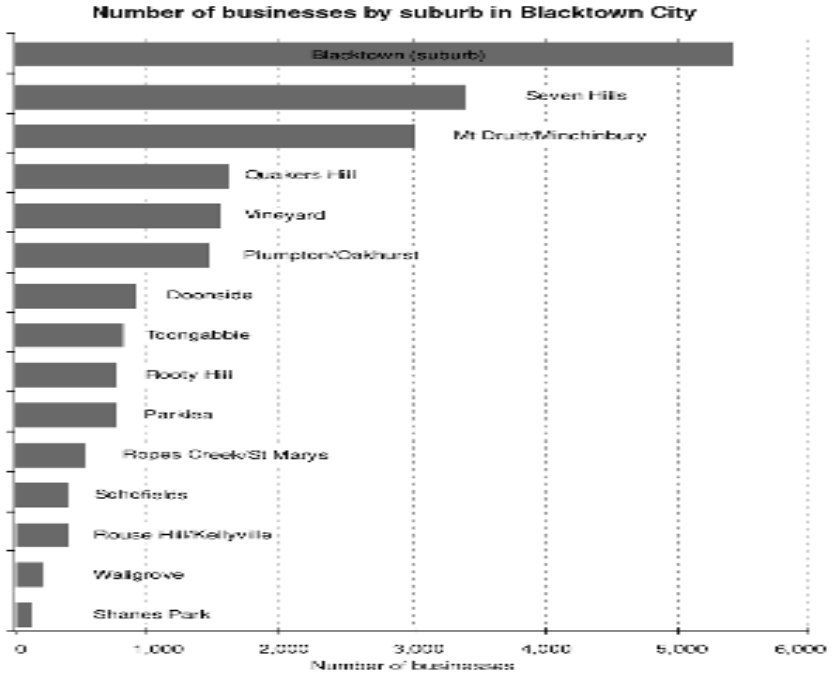
	Population,	Labour Force,	Change (%)	Local Jobs Target	Change (%)	Jobs /workforce
2001	**256,364**	**108,877**	**12.55%**	**71,141**	**12.56%**	**65.39%**
2006	**291,309**	**119,495**	**9.75%**	**83,259**	**17.03%**	**69.68%**
2011	**317,809**	**126,916**	**6.21%**	**89,522**	**7.52%**	**70.54%**
2016	**344,201**	**134,534**	**6.00%**	**95,275**	**6.43%**	**70.82%**
2021	**370,908**	**136,838**	**1.71%**	**100,414**	**5.39%**	**73.38%**
2026	**397,369**	**140,602**	**2.75%**	**105,611**	**5.18%**	**75.11%**

Data source: National Economics. Jobs: workforce ratio is calculated by dividing local job stock by labour force.

Economic development and employment creation in GWS

The Greater Western Economic Development Board (GWSEDB) strategy for '*Producing Growth through Expansion of Existing Industries'* is to attract new industry by promoting and supporting the retention and expansion of its existing enterprises. The GWSEDB sees the need for employment growth as paramount. Growth projections for the GWS population have been revised downwards since the 1991 Census, with estimates for population reduced to 1.75 million by 2021 as a result of the impact of urban consolidation policies on residential developments in the central and inner western suburbs. However, the Board's research has shown that even the slower rate of growth will require new job formation at the rate of approximately 1% a year, simply to ensure that present levels of unemployment do not worsen. As a result, the Board has made employment growth its primary measure of success for the industry strategy.

Figure 8

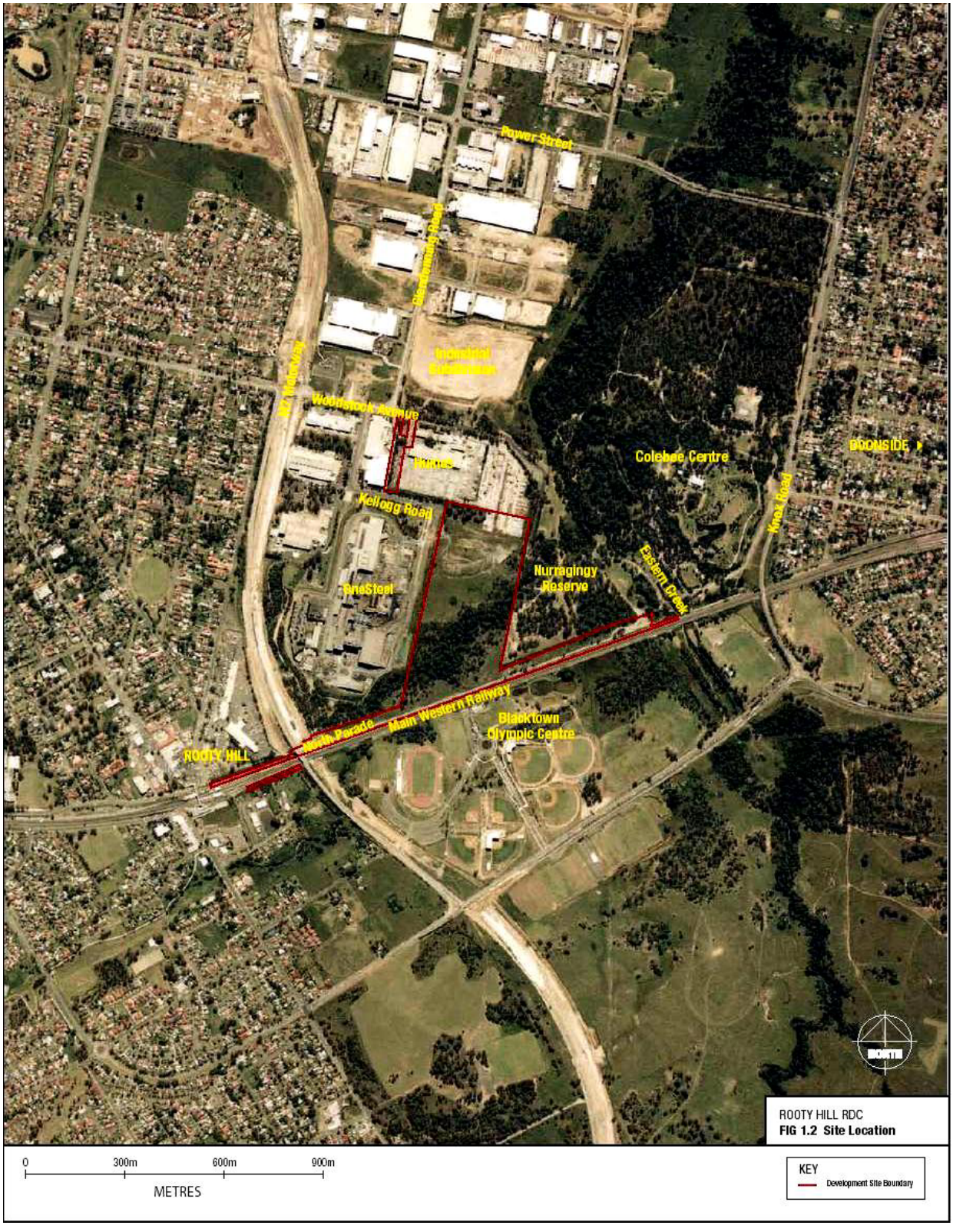


A breakdown of businesses in Blacktown by suburb indicates that Rooty Hill has some 800 businesses primarily represented by construction (including trade services), property & business services and retail. Typically these activities are classified as service orientated. It is noticeable that Rooty Hill has a small number of basic industries whose activities are defined as export orientated, included here are One Steel and the Readymix Humes concrete pipe production plant.

III. The Proposed Readymix RootyHill Regional Distribution Centre

The proposal by Readymix to build a RDC at RootyHill adjacent to its existing Humes plant involves a significant investment ($80-110 million) for the Blacktown local economy. The RDC will be a key component of the Readymix Rail based strategy and the site is strategically located (see Map) at the intersection of the Main Western Rail Line and M7 Motorway in an established and growing Industrial Zone. The proposed RDC at Rooty Hill will consist of a rail siding where construction materials from quarries are unloaded from trains and transported to enclosed storage bins by conveyor belt. The materials will be sorted and blended as required by the customer, and then distributed to the Sydney market via the M7. The site is at the end of Kellogg Road, Rooty Hill. The One Steel Mini Mill forms the site boundary to the west, Humes Pipe factory to the North, the railway and North Parade to the south, and Nurragingy Reserve to the east.

This development is required as Sydney's main local sources for Construction Materials, particularly the Penrith Lakes Development Corporation (PLDC) are running out. The PLDC will close by 2011-12, but will wind down from 2008. As the source of construction materials closer to Sydney run out, increased quantities of these materials must come from outside of the Sydney Basin. It is important that the RDC is ready to operate in 2008 to ensure continuity of supply of construction materials to the Sydney market.



Location Map RDC

IV. Economic Base Multiplier Approach

A useful way to understand the structure of the local government area of Blacktown is to view the region from the perspective of Economic Base Theory. The idea behind the theory is that local economic prosperity depends upon the existence and success of industries that export goods and services out of the local area.

Economic-base concepts originated with the need to predict the effects of new economic activity on cities and regions. Say a new plant is located in our city. It directly employs a certain number of people. In a market economy these employees depend on others to provide food, housing, clothing, education, protection and other requirements of the good life. The question which city planners and economists need to answer, then, is "what are the indirect effects of this new activity on employment and income in the community?"

These are the *basic* industries. They are the "wage earners" of the families in the area, bringing an income flow into the region. In this respect these activities may be described as "regional strengths" and of course can be in the primary, secondary or tertiary sectors. In addition to the *basic* industries there are *non-basic* local area activities, which exist to satisfy local demands generated within the region. These are "region serving" activities and again may be in any of the industrial sectors, these activities exist to "serve" the demands for goods and services generated within the region.

Economic Base Theory links non-*basic* activities to *basic* activities in the sense that the success of the *basic* industries determines the income flows into the region. The non-basic activities may therefore be considered as the recipients of the community wages earned by the basic activities, the non-basic activities satisfy service needs of the base employees. The dependency of non-basic activity upon basic activity is evident in the fact that employment and profitability in service [non-basic] activities is highly sensitive to changes in the base, rising and falling with it (Andrews, 1960, p.6).

Application of economic base theory to the Readymix RDC relies on economic growth impulses of this project to be transmitted from their activities to the regional services activities and ultimately to households via linkages. The extent and strength of these linkages will determine the magnitude of the impact of the export activities on the rest of the region's economic activity that is it will determine the size of the economic base multiplier. Well-developed linkages within the region will result in a higher multiplier.

Plugging the GAPS

Poorly developed linkages and gaps in the regional production chains will result in a low multiplier, as income brought into the region by the exporting firms will leak out of the region because of the need to import goods and services which the region itself is not capable of supplying. Just as the basic activities may be perceived as regional "strengths", these "gaps" in regional production chains may be viewed as regional "weaknesses", so that growth in the exporting activities, instead of acting as a multiplier in the local economy, are a stimulus to industries outside the region.

Economic base theory sees export activity as the cause and non-basic activity as the consequence. New units of export activity may be also attracted to a region because of the existence of the Readymix Rooty Hill Regional Distribution Centre. Likewise new service activities may be attracted to service the needs of these additional basic industries. All of which amounts to injection into the regional economic system.

According to the latest issue of Blacktown City's Economic Outlook, Blacktown is **'**NSW's most populous Local Government Area and is also one of Australia's largest regional economic drivers. To enhance the economic potential of Blacktown City, local business and industry, in partnership with key development actors and agencies are working to increase the region's ability to draw new income from outside the area (exports). This potential will also be best achieved by developing more internationally competitive local businesses. The City's current endowment of a large number of export-driven firms could provide the 'entry point' for many other local firms to enter global markets, as smaller firms learn from more seasoned exporters'.

Because of the difficulty of defining exactly what are the basic industries and determining the magnitude of their export activity analysts carry out surveys of firms to determine their forward and backward linkages and the proportion of sales made inside and outside the region. This is not too difficult for the large businesses, but for a small business owner determining whether their customers are from inside and outside the region is entirely problematic. In addition gathering such information is time-consuming and expensive. As a consequence a simpler, cheaper, though less accurate method is often used, namely the location quotient, which will be discussed below.

The data used in this analysis have been obtained from the Business Register of the Australian Bureau of Statistics (ABS). The Register contains information on the location, by postcode of all *employing* businesses and the numbers of persons employed. Businesses are classified down to the four-digit ANZSIC level. Absent from the data is unfortunately the large group of self-employed operators who are not included in the registry. In addition, as the ANZSIC level becomes finer and the geographic area becomes smaller problems of confidentiality arise. In the present study data were required at the four digit level and for areas as small as postcodes, though for the shift/share analysis these were then aggregated to the two-digit level. Because of the confidentiality problem data could be made available only in the form of counts of businesses by size classes. The data used are therefore approximations, but this is the best which can be achieved in studies such as this which involve small areas such as postcodes and business classification at a detailed level.

The industrial structure of a region is a key determinant of its prosperity, of its ability to provide employment and of its potential for economic growth. Additionally regions that are dominated by only a few firms or industries become susceptible to economic instability.

Developing a Local Multiplier for the Readymix RDC

The term 'economic impact' refers to the effects of an activity on an economic system (e.g. a regional economy). The particular approach used in this study is based on

employing a multiplier analysis (including input-output models), CGE modeling and integrated modeling. The appropriate technique is determined by the characteristics of the activity and the region being analysed, the purpose of the study, data availability, and the time and resources allocated to the study. A multiplier provides a measure of the overall effects on the regional economy of an initial change in the level of activity. Total impact is the sum of the direct effects (the initial round of output, employment and income) and the subsequent flow-on effects to other sectors of the economy.

The **Local Multiplier (LM)** tool enables you – whether you are a community organisation, business leader, or government official – to measure how much your organisation or initiative impacts on the local economy. And more importantly **LM** helps you work out where you need to make changes to improve that impact. **LM** takes its name from the Keynesian multiplier, which has been used since the early 20th century to measure how income entering an economy then circulates within it. The theory is that a change in income has a multiplied impact on that economy. We've adapted it for use at the local level, and we only measure one 'round' of spending. Across the US, UK and EUROPE, people have taken up **LM** to figure out how to make the most of the money that they do have so that their communities remain vibrant places to live. The LM has been employed to show how the multiplier can benefit the local economy due to new investment projects.

KEY PARAMETERS employed in the Readymix RDC Impact Study

Decisions about several key parameters are required to be made at the beginning of the impact study. These involve the definition of the industry; the region for estimating flow-on effects, the time period covered by the study and the indicators used to measure the effects of the project. Impact will use the commonly accepted definitions employed in Economic Impact Studies as provided under the term Definitions as defined below.

The products Readymix provides are construction materials utilised in building and maintaining Australia's infrastructure and built environment. These products are used significantly across the construction industry in the sectors of residential, industrial, commercial and also general infrastructure. These products come under the broad definition of ASIC (Australian Standard Industrial Classification) Manufacturing classification.

The region for assessing the flow-on effects of the Redymix development should be specified at the beginning of the study. Major options include the town of Rooty Hill where the Regional Distribution Centre (RDC) is located, the Blacktown LGA, and adjacent LGA's, or the State of NSW where the RDC is located. The region used in the analysis will reflect the interests of the primary audience for the study and the availability of data. For the Economic Impact Study the Blacktown LGA will be the area referred to by Impact in this study.

Flow-on effects extend beyond the initial round of purchases and employment, and represent the additional output, income and employment, generated resulting from second, third, and subsequent-round purchases flowing throughout the regional economy. For example, local suppliers to Readymix in turn purchase goods and services from other

local firms who in turn purchase goods and services from other local firms, and so on, as part of the supply chain. Similarly, households receive income as employees of Readymix and spend some of their income on local goods and services. This injection to local spending will create new jobs and income for local households.

Total **impact** is the sum of the initial and flow-on effects. As a result of the successive rounds of re-spending, the total impact on the economy exceeds the initial round of output, income and employment generated by the development. However, each successive round of re-spending is smaller than the preceding round as some of the spending goes on goods and services that are produced outside the region. The money, which leaves the region, is termed a *leakage* and will eventually limit the number of rounds of re-spending. As a consequence, the extent of the ripple effects of second, third, and subsequent-round purchases depends on the regional boundaries of the local economy. For example, the size of the flow-on effects of a particular activity will generally be smaller in the local (regional) economy than in the State economy, which will in turn be smaller than in the national economy as a result of the different levels of leakage.

A measure of the extent of the flow-on effects to other industries as attributed to a particular activity is the local *multiplier*. In broad terms, a local *multiplier* is an index that indicates the overall change in the level of economic activity that results from an initial stimulus. It effectively adds up all the successive rounds of re-spending, based on a number of assumptions that are embedded in the method of estimation. These can be expressed either in terms of absolute changes in the level of economic activity, or in terms of percentage changes.

V. Economic Base Employment Multiplier and Location quotient -

A statistical technique used in identifying competitive strengths in a region is the location quotient (LQ). An industry LQ equal to one may be taken to indicate that the region is self sufficient in this particular activity. If the LQ for an industry is less than one the region may be assumed to be importing this good or service, that this activity represents a regional weakness. Conversely, a LQ greater than one suggests a regional strength, that the region is exporting this good or service. These exporting sectors are the *basic* activities of Economic Base Theory and, as explained above, according to that theory, the key to economic growth and prosperity.

The technique measures the degree to which a region specialises in a particular industry relative to a reference region, which could be the state or nation of which the region is a part. It compares an industry's total employment (value added or wages paid could be used) in that region with that industry's share in the reference region. As Readymix's activities fall under the general heading of Manufacturing we take Manufacturing as the base industry for calculating the employment Multiplier and later calculating the impact of Readymix's RDC on employment in the Blacktown area.

The location quotient of Blacktown City industries (Table 5) indicates which industries have the potential to be significant exporters to the rest of Greater Western Sydney,

Sydney Metropolitan Area or Australia. Ranked in order of highest LQ, Blacktown's significant employing industries are; Electricity (2.8), Transport and Storage (1.2), Wholesale Trade (1.18), Retail Trade (1.13), Construction(1.1) and Manufacturing (1.04) completing the top six industries.

The larger reference region used for generating the LQ in Table 3 was Greater Western Sydney. The table shows that the above industries have employment significance and regional export potential when compared to the 14 LGA's that make up this region. It is interesting to note that these same industries maintained their employment significance and export potential when compared to larger reference regions such as Sydney Metropolitan Area, NSW and Australia.

Location quotient

A location quotient for an industry $\boldsymbol{LQ_i}$ is defined as:

$$\boldsymbol{LQ_i = (e_i/e)/(E_i/E),}$$

where $\boldsymbol{e_i}$ is the local area's (Blacktown LGA) employment in industry $\boldsymbol{i}$, $\boldsymbol{e}$ is total employment in the area (Blacktown LGA), $\boldsymbol{E_i}$ is employment in the benchmark economy (Greater Western Sydney) in industry $\boldsymbol{i}$, and $\boldsymbol{E}$ is total employment in the benchmark economy (Greater Western Sydney) .

Assuming that the benchmark economy (Greater Western Sydney) is self-sufficient then, a location quotient greater than one means that the economy of GWS has more than enough employment in industry $\boldsymbol{i}$ to supply the region and can export to outside the region. A location quotient less than one suggests that the area is deficient in satisfying the local demand with industry *i's output* and must import this product if the area is to maintain normal consumption patterns. The LQ for the entire of Blacktown's industry structure are provided below in Table 3. The actual data and formula used to calculate these location quotients are provided in Appendix A. and example to calculate the LQ for Manufacturing in Blacktown the following data was used.

Location Quotient for Blacktown Manufacturing With/Without the RDC

The formula and data used to calculate the effect of Readymix development are provided in *Appendix A*. Since Readmix plans to employ a total of approximately 230 - 270 workers at the proposed RootyHill RDC site, the new location quotient for Blacktown Manufacturing increases in size from 1.03 to 1.05. Given that the LQ for manufacturing increases due to the additional employment generated by the Readymix RDC this means that Blacktown's manufacturing ability to export also increases. (Note that GWS employment in manufacturing and GWS total employment figures excludes Readymix RDC employment effect).

Initially surplus or export employment in manufacturing industry was approximately 530 given the existing location quotient without Readymix. With the the Readymix

investment at RootyHill export employment increases to 680 bringing about an additional net increase of approximately 150 workers to the export employment capacity of the Blacktown LGA.

Table 5 Employment and Location Quotients by Major Industries in Blacktown, Greater Western Sydney and Sydney Metropolitan Area

	Blacktown	Industry totals for GWS	Industry totals for SMA	Industry totals for NSW	Industry totals for Australia	Blacktown LQ to GWS	Blacktown LQ to SMA	Blacktown LQ to NSW	Blacktown LQ to Australia
Agriculture, Forestry and Fishing	502	6,107	9,736	90,250	330,782	0.653	1.213	0.205	0.177
Mining	36	1,296	2,671	14,288	75,178	0.221	0.317	0.093	0.056
Manufacturing	**14,234**	**108,876**	**211,119**	**305,855**	**1,010,179**	**1.039**	**1.586**	**1.719**	**1.644**
Electricity, Gas and Water Supply	**1,350**	**3,809**	**10,692**	**20,081**	**60,692**	**2.818**	**2.970**	**2.484**	**2.595**
Construction	**4,798**	**34,603**	**84,271**	**178,439**	**558,582**	**1.102**	**1.339**	**0.993**	**1.002**
Wholesale Trade	**6,807**	**45,680**	**106,321**	**149,325**	**437,134**	**1.185**	**1.506**	**1.684**	**1.817**
Retail Trade	**12,826**	**90,158**	**231,888**	**379,847**	**1,211,332**	**1.131**	**1.301**	**1.247**	**1.235**
Accommodation, Cafes and Restaurants	1,965	20,700	81,924	137,578	410,589	0.755	0.564	0.528	0.558
Transport and Storage	**3,879**	**24,205**	**83,290**	**121,707**	**355,874**	**1.274**	**1.096**	**1.177**	**1.272**
Communication Services	990	8,972	40,135	53,299	148,480	0.877	0.580	0.686	0.778
Finance and Insurance	1,245	16,797	109,809	129,765	312,396	0.589	0.267	0.354	0.465
Property and Business Services	4,931	48,956	248,329	324,470	920,331	0.801	0.467	0.561	0.625
Government Administration and Defence	2,104	21,354	60,641	100,937	369,855	0.783	0.816	0.770	0.664
Education	**5,881**	**42,269**	**112,498**	**183,391**	**595,398**	**1.106**	**1.230**	**1.185**	**1.152**
Health and Community Services	5,248	54,791	156,119	252,077	806,171	0.761	0.791	0.769	0.759
Cultural and Recreational Services	1,216	10,380	47,388	65,569	202,456	0.931	0.604	0.685	0.701
Personal and Other Services	2,381	20,655	60,850	95,493	300,658	0.916	0.921	0.921	0.924
Non-classifiable economic units	352	2,528	7,026	10,871	47,906	1.107	1.179	1.196	0.857
Not stated	394	3,421	8,884	14,766	144,613	0.916	1.043	0.986	0.318
	71,139	565,557	1,673,591	2,628,008	8,298,606				

Source: Compiled from ABS and RUGS(UWS)

Care needs to be taken in the interpretation of Location Quotients

Analysis is sensitive to the way the region is defined. Smaller regions are likely to be more specialised. In addition, the ANZSIC level at which the analysis is carried out will affect the results. And an activity in which a region appears to be relatively highly specialised may make only a minor contribution to the regional economy in absolute terms. The overpowering advantages of using location quotients are that the method is inexpensive and the exercise of computing excess employment may give the analyst an opportunity to gain insights of interest in themselves.

Developing an Employment Multiplier for Blacktown

This basic/non-basic employment 'multiplier' is equal to total employment in both basic and service activities divided by total basic employment (Isard, Methods of Regional Analysis, 1960, p, 190). Actual data and formula used to calculate the employment multiplier appears in Appendix A.

In defining non-basic and basic categories we rely on an arbitrary assignment of non-basic to basic industries by identifying non-basic industries as activities, which are primarily servicing the basic industries. We assigned employment for entire industries into categories by estimating the proportion of employment involved in basic activities. Based on this application we generated an employment multiplier for Blacktown of 2.4 implying that for every RDC job created in Blacktown an additional 2.4 jobs are generated across all industries in Blacktown this would include service (non-basic) activities and other basic industries.

Readymix Rooty Hill Local Multiplier (LM)

Economics makes a lot more sense when you can see it in action, so let's take a detailed analysis of the economic impact of Readymix's Regional Distribution Centre using the local multiplier **LM** approach. We start off by analysing income. Let's assume Readymix's annual wages for employees at its Rooty Hill RDC turned out to be approximately $16 million per annum (based on an average annual wage of $60,000 per employee X 270 employees). The number of employees is based on the maximum projected employment resulting from the Readymix investment. The actual number of employees working at the RDC increases the amount of spending locally since the proportion that workers spend locally is a fixed amount of the total wages of the RDC. Impact surveyed Readymix workers spending patterns in January 2005 and discovered that on average workers at the Readymix Humes plant in Blacktown spend an average of 26% of their incomes locally (Blacktown City).

Based on an average of 26% of their incomes spent locally (Blacktown City), the flow – on effect of the RDC within Blacktown in the first year of operations, amounts to approximately $4 million ($16M x 26%). Impact also surveyed local business's and discovered that on average Blacktown business's spend approximately 29% of their turnover locally, accounting for an additional $1.2M ($4M x 29%). expenditure within Blacktown In total the amount re-spent locally by Readymix's staff and suppliers totaled $5.2 million ($4M + $1.2M).

Saying that Readymix has generated approximately $5.2 million for the local economy sounds impressive but becomes more meaningful when expressed as a proportion of what Readymix actually paid in wages. The LM is calculated by expressing the total dollars generated $5.2 million relative to the total annual wage of $16 million deriving a local multiplier of 0.33. The multiplier for the first round (we would normally go several rounds) is therefore 0.33 this implies that for every $1 Readymix pays as wages the Blacktown local economy receives an additional $0.33.

The multiplier calculations we've described have previously been used by economists employing computer programs, data sets, tables, charts, and so on. **Impact** has adapted the techniques we've been describing and created a tool called **LM** (for 'Local Multiplier'). We call it 'local' because it's for local use, not macroeconomic use. As you can imagine, we could go on measuring people spending forever, but we have to draw the line at some point. Since most of the spending takes place in the first three rounds, we stop there.

Very importantly – our LM tool is an *indicator*. As indicators are not exact measurements they do give us a general sense of how something is doing. Likewise, when you calculate you're LM, your result will offer general insight into how one aspect of your local economy is working, rather than a fixed, unchangeable fact.

Net Employment effect of the RDC on GWS

With regard to the transfer of employees from other Readymix sites to the RDC the following analysis provides a breakdown of both the number of employees transferring across from other Readymix operations to the RDC and the associated skills involved. The transfer of workers from other Readymix sites located within GWS to the RDC will have no net impact in terms of new employment positions generated by the RDC on the broader economy of GWS. The initial multiplier effect of an additional 230 – 270 jobs located at the RootyHill site will primarily benefit the Blacktown local Government area and adjacent LGA's. Overall what affects the GWS economy in terms of employment generation is the number of additional new jobs which the RDC operation will bring to the GWS economy.

What determines the net effect of the RDC on regional GWS economy is the total net number of employees (New Positions) which the RDC generates. ***The region*** for assessing the flow-on effects of the Redymix development is important in determining both the direct and indirect effects of the RDC. The major options include the town of Rooty Hill where the Regional Distribution Centre (RDC) will be located, the Blacktown LGA, and/or the regional economy of GWS. At the LGA level Blacktown will experience an increase in employment of 230 - 270 due to the RDC locating at Rooty Hill. However when we expand the study area to take account of the larger GWS regional economy from where Readymix employees are transferred we can capture more of the net effect of the RDC operation on the wider region in terms of the number of net jobs generated by the Rooty Hill RDC.

On the basis of a number of scenarios regarding the potential transfer of Readymix employees from other Readymix operations across GWS, Readymix estimates that the number of positions created by the RDC operation at RootyHill at approximately 60 new positions based on current estimates. This figure is based on the difference between the projected total numbers of employees employed at the RDC minus the potential number of transfers from other Readymix operations. Generally speaking it should be borne in mind that while the total number of workers employed at the RDC will reach 230 to 270 employees at maximum operating levels, the number of workers potentially transferring across from other Readymix operations is only an indicative number at this stage.

Summary of Employment Numbers at the RDC (Fully Operational Capacity)

	Total Potential Employees
Rail and Distribution Centre	35
Transport Fleet	80
Concrete Plant	25
Concrete and Raw Materials Laboratory	27
Regional Office	65
Total RDC Direct Employment	232
Total Indirect Employment	30 - 40

Source: Readymix

Impact of RDC on GWS Employment

To estimate the impact on GWS of the RDC we now require a new multiplier calculated for the entire GWS regional economy. The GWS employment multiplier calculated in Appendix A equation (4) represents the number of additional workers which each new employment position in GWS generates in terms of gross employment numbers. Based on a projected increase in employment of 60 new positions as a result of the RDC development at RootyHill and assuming an employment multiplier for GWS of 3.65 Impact estimated that an additional 220 jobs will be created in the GWS economy (3.65 x 60) as a result of the RDC development at RootyHill.

Expenditure Multiplier for GWS (New Employment Positions)
Let's assume Readymix's annual wages for employees at its Rooty Hill RDC turned out to be $3.6 million per annum (based on an average annual wage of $60,000 per employee X 60 employees). Impact has estimated that Readymix workers spend an average of 36% of their incomes within the GWS regional economy, in the first round of expenditure; this means that Readymix workers spend approximately $1.3 million in the GWS ($3.6M x 36%) local economy. These expenditure figures are based on the potential new employment positions been created by the RDC at RootyHill.

VI. The Economic Impact of the Construction Phase

The Readymix RDC will contribute to the Blacktown and GWS economy in two major ways. Firstly, the wages and salaries of many of the workers at the RDC are spent locally on a wide range of goods and services (refer to the local multiplier effect above) Secondly, contractors employed by Readymix during the construction phase will spend money locally on goods and services. These direct local expenditures generate additional ("indirect") economic activity within the Blacktown and surrounding area's as some of the local businesses will also spend a proportion of their turnover on goods and services supplied by local businesses.

Based on projected expenditure Readymix plans to spend $80 - $110 million on the construction of the RDC at Rooty Hill. Approximately $35M - $40M of this expenditure will be paid on Wages and Salaries to Construction workers employed over the construction phase which is expected to take approximately two years to complete. A breakdown of the construction phase includes the following major components; Earthworks, Rail Siding, Pavement & Drainage, Materials Handling System, Office and Laboratory Buildings, Concrete Plant and Bridge construction. The construction phase will employ approximately up to 220 people over the life of the project peaking to 150 at any one time. As some of the planned construction activities will be performed concurrently the number of workers employed on construction will at times exceed the average number of workers on site. Construction activities would occur over 6 days per week in accordance with NSW local planning and EPA requirements.

To estimate the multiplier effect of the Construction phase on the GWS economy Impact assumes that approximately $35 M of the total capital cost of the Readymix investment is payed on Wages. Based on the assumption that Readymix workers spend approximately 26 per cent of their income locally this means that local business's experience an increase in turnover of approximately $9 M (26% x $35M) additional income within Blacktown. Estimating income generated at the level of the broader GWS economy Impact estimates that workers spend an additional 30 per cent of their income equivalent to approximately $10.5M. In total combining the proportion of incomes spending at the local and broader GWS level is equivalent to approximately $19.5M dollars generated for the GWS economy (incl Blacktown) over the construction phase of the RDC.

VII. Overall Assessment of Readymix RDC on GWS

The RDC will directly provide employment for between (230 – 270) people; this will be a significant increase in employment for GWS in particular for Blacktown LGA. Furthermore Impact has estimated that approximately another 640 (Multiplier times 270) jobs will be generated across GWS as a result of the multiplier effect from directly employing workers at the RDC.

The construction phase would employ approximately up to 220 people over the life of the project peaking to 150 at any one time. Readymix direct expenditures will amount to $80-$100 million of which wages and salaries will account for around 35%. The construction phase will take approximately two years to complete.

Because most of the economic activity generated by the RDC stems from wages and salaries paid to those working at the RDC, the benefits will be spread across a wide range of local businesses including principally retailers and providers of services to households. Relatively few of these businesses would draw more than 26% (local multiplier estimate) of their turnover from Blacktown wage earners employed by Readymix.

VIII. Benefit Cost Analysis for the Readymix RootyHill RDC

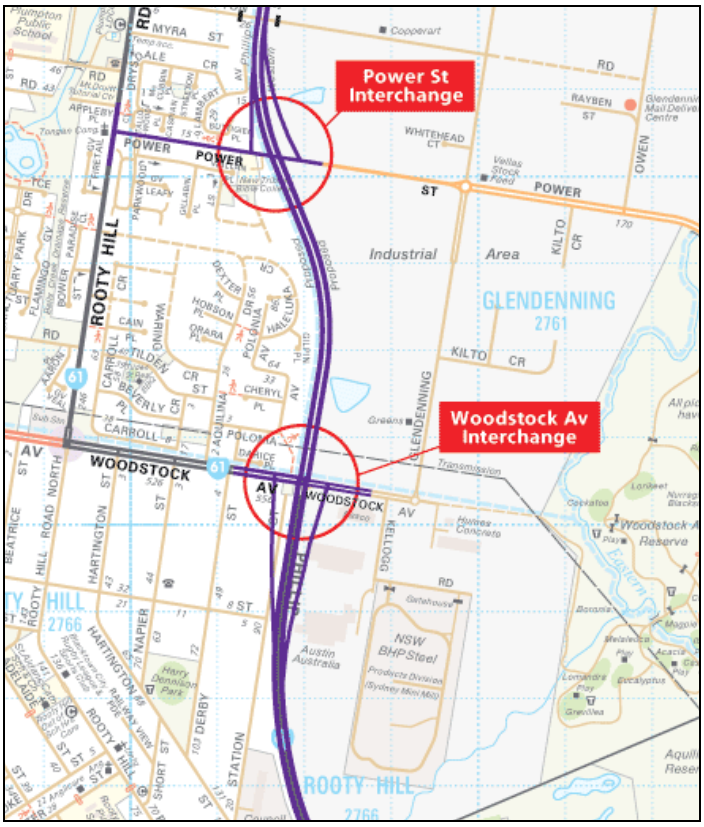
Benefit-cost analysis (BCA) examines whether a project/investment constitutes an efficient use of resources either from the point of view of society as a whole, or from the perspective of the proponent. The latter reflects a private BCA and is known as a feasibility analysis. This BCA will take into account costs and benefits which may not be reflected in monetary transactions (for example the value to the public of travel time savings from a new road). While this economic appraisal will assess the costs and benefits associated with the proposed Regional Distribution Centre at RootyHill, the overall objective of the report is to show that the economic appraisal takes into consideration cost and benefits from the overall community perspective.

The objective of this part of the *Economic Impact Analysis* is to provide an economic appraisal of the costs and benefits associated with the proposed Readymix Regional Distribution Centre (RDC) at RootyHill located in the Blacktown LGA. The RDC will operate as a primary receiving centre for quarry raw materials and a distribution centre for construction materials to markets across the Sydney Metropolitan Area (SMA). The proposed RDC will make a significant contribution to the GWS economy (as already provided in the multiplier analysis of the RDC) and the efficiency with which the supply of construction materials are provided to the Sydney markets.

Traffic Impact Study RDC Operational Irwin Consult

The main '*Traffic Impact Study'* assumes that all heavy vehicle movements related to the RDC will utilise the M7 and will not encroach on residential streets. This includes the delivery of dangerous goods such as fuel to the site. The proposed RDC is not scheduled to become operational until 2008, and will open only after the M7 is commissioned. The traffic impact study analyses existing and predicted post development traffic for Kellogg Road, Woodstock Ave and Glendenning Road mainly, with some comments provided for Power St.

The '*Traffic Study'* underlines the fact that the M7, upon completion, will be a high capacity motorway, able to accommodate around 6,000 - 8,000 vehicles per hour (two-way). The expected traffic generated from the RDC site (maximum of 295 total vehicle movements in the peak hour - of which not all will use the M7) will be minor in comparison and will therefore have negligible impacts on the performance of the motorway. The proposed on and off-ramps of the M7 will allow vehicles to accelerate and decelerate safely upon entering or exiting the motorway.



Location and configuration of M7 interchanges

The Traffic Impact report refers to the RTA's modelling results for the proposed M7 which indicates that the opening of the motorway will reduce traffic levels along the Rooty Hill Road South by approximately 58%. It is also estimated that a potential reduction in traffic of approximately 68% will be experienced along the Rooty Hill Road North.

Forecasts for the Post-Development Conditions Traffic situation are based on the assumption that the proposed RDC is not scheduled to become operational until 2008, after the opening of the Westlink M7. The RDC development will generate traffic due to the employee movements and the distribution of aggregates and concrete from the site. All heavy vehicle access to the facility will be via Kellogg Road.

While the RDC will increase traffic circulating around the area, the *'Traffic Study'* analysis shows that the nearby intersections are expected to operate satisfactorily when the development becomes operational, however some upgrades may be required. In particular the *'Traffic Study'* recommends that a *'two-lane roundabout option be constructed prior to the RDC becoming operational'*, this will provide an additional amenity and safety for all vehicles at the intersection.

Benefit Cost Impacts: As in the case of the *'Traffic Impact Construction Study'* the overall costs of increased traffic flow associated with the proposed RDC cannot accurately be quantified and stated in terms of dollar values. However there are benefits to be highlighted associated with the location of the RDC at RootyHill close to the newly constructed M7. As indicated above the additional traffic associated with the proposed RDC will deliver construction materials to the Sydney market. Apart from minimized delays experienced by local traffic in the immediate vicinity of the RDC the heavy vehicles used to transport materials to Sydney markets will use the M7. The location of the RDC adjacent to the M7 allows these heavy vehicles to travel short distances to access the motorway therefore avoiding adding to the congestion on the surrounding roadways. In conclusion the traffic impact of the proposed RDC highlights the effect of operating the proposed RDC (4Mtpa) at RootyHill where the bulk of raw materials are transported to the RDC *via* rail from outside the Sydney Basin in contract to the alternative whereby quarry raw materials would need to be transported *via* road from outside the metropolitan area. The costs involved in the latter scenario would see an increase in truck kilometres travelled both within and outside the metropolitan area in comparison to locating the RDC (4Mpta) at RootyHill which require fewer trucks travelling within the metropolitan area and a reduction in haulage distance covered.

Air quality impact assessment: Holmes Air Sciences

Assessment: The air quality assessment is based on the use of a computer-based dispersion model to predict ground-level dust concentrations and deposition levels in the vicinity of the project area. To assess the effect that the dust emissions would have on existing air quality, the dispersion model predictions have been compared to relevant air quality goals.

Construction Issues: Air quality impacts during construction would largely result from dust generated during earthworks and other engineering activities associated with the facilities construction. As construction is likely to continue for up to two years, it is important that exposed areas be stabilised as quickly as possible and that appropriate dust suppression methods be used to keep dust impacts to a minimum. It is desirable that monitoring be carried out during the construction phase of the project to assess compliance with DEC goals. A minimum of three deposition monitors would be required, ideally at the closest residences or other sensitive receptors.

RDC Operational Issues: The air quality impact assessment has assessed the air quality impacts associated with the operation of a Regional Distribution Centre off Kellogg Road, Rooty Hill**.** The conclusion of the air quality assessment is that air quality impacts would be at acceptable levels and that air quality goals would not be exceeded at sensitive locations due to the operation of the plant at full capacity of 4 Mtpa.

Benefit Cost Impacts: Greenhouse Issues

Without the project Readymix would deliver all materials direct to customers by road from outside the metropolitan area. This would see an increase in truck kilometres travelled both within and outside the metropolitan area. In contrast the project would see the bulk of raw materials brought to the RDC by rail from outside the Sydney Basin. This will require fewer trucks travelling within the metropolitan area and a reduction in haulage kilometres.

Greenhouse emission statistics and CO_2-equivalent emissions for trucks and trains associated with distribution to Sydney customers are provided in **Table 1** of the Air Quality report. This table presents calculations for the 'with' and 'without' project scenarios.

Table 1 : Greenhouse emission statistics

	Without project	With project	
Mode of transport	By road	By road	Additional by rail
Fuel consumption (l/km)	0.521[1]	0.521[1]	12[2]
VKT (millions of km)	38.8	7.3	0.422
Total fuel consumed (millions of l/y)	20.2	3.80	5.06
CO_2-e emission factor for transport fuel (t/l)[3]	0.0027	0.0027	0.0027
Total CO_2-e emissions (t/y)	54,540	10,269 + 13,673 = 23,942	

[1] *Australian Greenhouse Office, 2002*
[2] *Estimate from personal communication between Pacific National and Readymix (4 L/loco/km and 3 locos per train)*
[3] *Full fuel cycle analysis, Australian Greenhouse Office, 2003*

From these calculations, the estimated CO_2-equivalent emissions with the project are 30,598 tonnes per year lower than without the project. In addition greenhouse gases would also be released indirectly from the use of electricity. This has been estimated as approximately CO_2-e emissions due to electricity consumption is 7,333 t/y. Overall there is substantial reduction in CO_2-equivalent emissions when the 'with project' scenario is compared to the 'without project' alternative.

The Aquatic Ecology Assessment: Biosis Research

Assessment: The aquatic ecology assessment of the proposed development of the Kellogg Road Regional Distribution Centre (RDC) located on Angus Creek, Rooty Hill. Angus Creek is a tributary to Eastern Creek, 300 m to the east, in the South Creek drainage of the Hawkesbury-Nepean Catchment.

RDC Construction/Operation Issues: The RDC development involves the bridging of Angus Creek in two locations, one with a 27 m wide rail siding and road and the other with a 15 m wide conveyor and road. This would result in the removal of approximately 0.2 ha of riparian woodland vegetation. This study focused on the aquatic habitat within the site, upstream and downstream of the proposed bridges, as well as in nearby Eastern Creek.

Benefit Cost Impacts: The Aquatic Assessment indicated there were no threatened aquatic species, populations or endangered ecological communities listed under the FM Act or the EPBC Act found during this study. It was concluded that there are no known threatened aquatic species, population or endangered ecological communities listed under the FM Act or the EPBC Act likely to be present in Angus creek or Eastern Creek.

The Aquatic Assessment considered unlikely that the proposed developments will significantly affect the aquatic ecology values of Angus Creek if the following design and mitigation measures are incorporated:

- development of suitable sedimentation controls for the construction and operation of the plant, rail siding and conveyor;
- revegetation of impacted areas and regeneration of the riparian zone;
- establishment where possible of a 40 m buffer zone for the creek line;
- application of Department of Primary Industries, Fisheries policies on "Bridges Causeways and Culverts" and "Snag management";
- the monitoring of Angus Creek and Eastern Creek during the construction and rehabilitation phases.

Consideration of relevant Key Threatening Processes listed on the FM ACT and other threats to the aquatic habitat values of Angus and Eastern Creek indicate that the proposal will *potentially* have a negative impact on the aquatic habitats in the study area. In order to minimise these impacts for the initial inundation area, it is recommended that the following measures are implemented:

- development of sedimentation and vegetation management plan;
- silt fencing during construction and rehabilitation;
- construction of sediment/dust and runoff controls for the rail siding conveyor belt, batching plant and access road;
- siting of fuel storage and wash down areas away from the creek line and constructed with appropriate bunding to prevent runoff into drainage lines;

- maintaining where possible a 40 m riparian buffer zone
- revegetation of impacted areas with appropriate local species and stabilisation of impacted riparian areas and banks;
- riparian vegetation should be maintained and enhanced though a vegetation management plan, bush regeneration, and rubbish removal;
- undertake the monitoring program outlined in Section 6 during the construction and rehabilitation phases.

Overall the impact of the RDC (4Mtpa) locating at the RootyHill site will not significantly affect the aquatic ecology values of Angus Creek given that the recommendations in the Aquatic Assessment are implemented. Where these recommendations are followed the Aquatic Assessment indicates improvements to the aquatic ecology values of Angus Creek. The Aquatic study highlights some *potential* cost to the ecology values of the Angus Creek resulting form the RDC development. These potential costs are ameliorated following the implementation of the recommendations in the Aquatic study.

Archaeological Assessment Heritage Consultants

This study completed archaeological investigations for the proposed RDC development area and allowed consultation with representatives of local Aboriginal groups. The assessments include historical research, literature and register reviews, archaeological field survey and inspection and Aboriginal consultation.

The archeological assessment found there were no Aboriginal archaeological constraints to the proposed development at the Readymix site at Kellogg Road, Rooty Hill. While recognising that the archaeological investigation consisted of a surface survey only and every effort has been made to assess the subsurface potential of the study area, the presence of subsurface archaeological deposits cannot be entirely discounted.

The study recommended that:

- if during development operations Aboriginal relics or sites are encountered, then the NSW NPWS should immediately be informed. Work should cease in the area of the finds until their significance has been determined and appropriate management strategies, as necessary, have been determined.

Noise Impact Assessment Heggies Australia Pty Ltd (Heggies)

Assessment: The Noise Impact Assessment presents the results and findings of the noise assessment including consideration of construction, road and rail traffic and operational noise from the proposed development. The objective of the survey was to measure noise levels at the nearest potentially affected residential locations during the day, evening and night-time periods to enable the determination of the intrusiveness and amenity criteria for the proposed development.

RDC Construction: Construction noise levels are predicted to meet the relevant noise goals at the nearest potentially affected residential receivers and various noise management techniques have been presented in this report to reduce the noise impact on the Nurragingy Reserve during the construction phase of the proposed development.

RDC Operations: Operational noise predictions show that noise levels from the RDC during a typical night-time operational scenario will on average not be expected to increase at the nearest located residential areas as a result of operation of the RDC. The increase in rail traffic generated by the RDC of an average of four trains per day (an average increase of eight rail movements per day on any particular section of the line) is predicted to increase the existing rail noise level by less than 0.5 dBA. This is considered to be a negligible increase in noise levels and such an increase would not be discernible.

Benefit Cost Impacts: Operational noise levels are predicted to meet the project specific noise criteria at all residential locations under calm and prevailing weather conditions. In addition, predicted operational noise levels from the subject site do not exceed the acceptable noise levels at the Colebee function centre and the Blacktown Olympic Venue and do not exceed the recommended maximum noise amenity level in any areas of the Nurragingy Reserve.

Predicted maximum noise levels from operation of the proposed RDC during the night-time period are also predicted to meet the recommended sleep disturbance noise goal. Road traffic noise levels are predicted to satisfy the requirements of the ECRTN.

The Noise study found noise levels not to exceed the recommended maximum noise amenity level in the surrounding residential areas of the proposed RDC. In addition the operation of the proposed RDC during the night-time period is also predicted to meet the recommended sleep disturbance noise goal. In conclusion there is no measurable increase in noise which would amount to an increase in costs due to sleep disturbance or nuisance form increased noise associated with the RDC proposal

Flood Study Assessment Bewsher Consulting

Assessment: The study used a two-dimensional flood model which allowed a very detailed and accurate picture of the Angus Creek flood regime. The combined use of very detailed information about local area ground levels and structures spanning both Angus Creek and Eastern Creek and catchments runoff flows which are consistent with an earlier Council flood study has resulted in a comprehensive definition of the *'existing conditions'* 100 year ARI and probable maximum flood (PMF) flood regimes in and surrounding the area occupied by the RDC project;

RDC Construction/Operations: The inclusion of the RDC project elements into the flood model indicates that there would be only minor changes to — and no incremental increase in flood damages in — the 100 year ARI flood event. Similarly the modelling

shows that the project does not have major adverse impacts on the passage of an extreme flood event.

Benefit Cost Impact: Given that the flood model indicates there to be no incremental increase in flood damages in – the 100 year ARI flood event there are neither quantifiable of unquantifiable costs associated with the RDC proposal locating at RootyHill

Landscape: Visual impact assessment Context Consultants

Assessment: The aim of the report is to provide an assessment of visual impacts resulting from the proposed development of a regional distribution centre at the Readymix site in Rooty Hill. The report also recommends mitigating measures to ameliorate the visual impacts identified and presents a landscape master plan for the site which incorporates these measures.

The construction phase is expected to take 24 months to complete. Measures to reduce visual impacts during this period relate to maintenance of the construction site in a neat and orderly state. Measures which can be adopted during the operational phase relate primarily to maintenance of the site in a clean and orderly state

The landscape master plan addresses these recommendations by increasing the density of plantings around the boundaries of the site, both inside and potentially outside the site. The design also addresses the visual amenity within the site, including provision for tree and shrub planting and turfed areas. Implementing these recommendations will clearly incur a cost on behalf of the proponent of the project, however the benefit of such undertakings will overall nullify the visual affects of the project to surrounding residential areas.

Flora and Fauna Biosis Consultants

The Flora and Fauna study comprises an area cleared /disturbed grassland directly north of the Main Western rail line, an area of native woodland along the Angus Creek, which crosses the site and a large area of cleared/disturbed land and scattered sections of native vegetation bordering the adjacent Humes industrial site. The woodland is described as composed of moderate and poor quality Cumberland Plain Woodland and poor quality River-flat Eucalypt Forest both listed as Endanger4ed Ecological Communities (EEC) in Schedule 1 the Threatened Species Conservation Act (TSC Act) 1995.
The proposed RDC development at Rooty Hill would remove an area of approximately 1.6ha of native vegetation and a further 8.5 ha of cleared/disturbed grassland area. This includes 0.5 ha of moderate quality and 0.9 ha of poor quality Cumberland Plain Woodland and 0.2 ha of poor quality River-flat Eucalypt Forest.

Benefit Costs: The Flora and Fauna study assessment of the effect on the proposed RDC development area's flora and fauna is not significant provided recommended measures

are undertaken to mitigate the effects. The cost for the proponent of the development site involves the implementation of the following recommendations which will minimise the impact on the indigenous flora and fauna of the proposed development area:

vegetation Management Plan (VMP) be prepared and implemented

revegetation of Cleared/Disturbed Area outside the development footprint and areas disturbed by the construction, using locally endemic native species

a 20 m woodland buffer zone to be established around the G.juniperina ssp.juniperina site

fencing of the native vegetation outside the development footprint

implementation of appropriate sediment control including silt fencing

protection of native hollow bearing trees

provision of additional sheltering habitat for the Cumberland Plain Land Snail, in the Cumberland Plain Woodland areas

Conclusion

Overall the benefits of the proposed RDC at RootyHill are significant in terms of environmental and economic benefits which the project will bring to the regional economy of Greater Western Sydney. Over the longer term the RDC development at RootyHill is seen as a sustainable development given the significant reduction in environmental costs which the project demonstrates over alternative's considered. In addition the clear economic benefits of the Readymix RDC project demonstrated in the economic impact analysis will have significant short and longer term impacts on the economy of Greater Western Sydney in terms of the number of jobs created and maintained by the Readymix RDC development at Rooty Hill.

Definitions

The definitions used in economic impact analyses are defined in the report.

The term *economic impact* refers to the effects of an economic activity (agricultural operations) on an economic system such as regional, state or national economy. These effects are measured in terms of monetary units and employment. In this study, the impacts are measured on four key economic indicators:

Gross output. This represents the total value of production or total expenditure on all goods and services purchased in the chain of production by firms in the region.

Gross regional product. Gross output measures are susceptible to multiple counting because they sum all the intermediate transactions over all stages of production during the production process. Consequentially, they can substantially overstate the contribution to economic activity. A preferred measure of the contribution to economic growth is *value added*. This is technically defined as wages and salaries and supplements paid to labour plus gross operating surplus plus indirect taxes on products and production less subsidies, but for practical purposes measures payments to factors of production (labour and capital), including net taxes on production. The sum of all industry value added is equal to gross regional product (GRP), so value added impacts refer to the contribution to GRP (or gross state product (GSP) at the state level and gross domestic product (GDP) at the national level).
Household income. This is the income earned by employees during the production process.
Employment. The number of full-time equivalent jobs generated. The economic impacts are estimated for:
Initial or *direct* effects which are the impact of the industry *per se* associated with direct purchases and employment by agricultural operators in the Tweed Shire, and represent the initial round of output, income and employment generated by the activity. For example, sugar cane growers purchase inputs (eg, equipment and fuel) from local suppliers. This is the first round impact.
Flow-on effects, which extend beyond the initial round of purchases and employment, and represent the additional output, income and employment generated resulting from second, third, and subsequent-round purchases flowing throughout the regional economy. For example, local suppliers to cane growers in turn purchase goods and services from other local firms who in turn purchase goods and services from other local firms, and so on, as part of the chain of production. Similarly, households receive income as employees of cane farmers and spend some of their income on local goods and services. These purchases result in additional local jobs. Some of the income from these additional employees is in turn spent on local goods and services, thereby creating further jobs and income for local households.
Total impact which is the sum of the initial and flow-on effects. As a result of the successive rounds of re-spending, the total impact on the economy exceeds the initial round of output, income and employment generated by agricultural operations. However, each successive round of re-spending is smaller than the preceding round as some of the spending is on goods and services that are produced outside the region. The money, which leaves the region, is termed a *leakage* and will eventually limit the number of rounds of re-spending. As a consequence, the extent of the ripple effects of second, third, and subsequent-round purchases depends on the regional boundaries of the local economy. For example, the size of the flow-on effects of a particular activity will

generally be smaller in the local (regional) economy than in the State economy, which will in turn be smaller than in the national economy as a result of the different levels of leakage.

A measure of the extent of the flow-on effects to other industries attributed to a particular activity is the *multiplier*. In broad terms, a *multiplier* is an index that indicates the overall change in the level of economic activity that results from an initial stimulus. It effectively adds up all the successive rounds of re-spending, based on a number of assumptions that are embedded in the method of estimation. These can be expressed either in terms of absolute changes in the level of economic activity, or in terms of percentage changes. In the latter case, the index is referred to as an *elasticity*.

Appendix A

The Location Quotient & the Multiplier

The location quotient (l.q.) is frequently used to estimate the economic base of a region. How will we do that? If the l.q. for a sector exceeds one, the sector is presumed to export. Thus, we take all sectors with an l.q. of above one and determine, sector by sector: (and then sum the export employment for all these sectors$_i$)

$$\text{Local Service Employment in sector}_i = \frac{\text{Total Employment in sector}_i}{\text{l.q.}}$$

$$\text{Export employment for sector}_i = \text{Total Employment in sector}_i \left(1 - \frac{1}{\text{l.q.}_i}\right)$$

(1) Calculating the *Location Quotient* (LM) for Blacktown Manufacturing

Blacktown employment in manufacturing = 14,234 = $\boldsymbol{e_i}$
Blacktown total employment = 71,139 = $\boldsymbol{e}$
Greater Western Sydney's employment in manufacturing = 108,876 = $\boldsymbol{E_i}$
Greater Western Sydney's total employment = 565,557 = $\boldsymbol{E}$

$\boldsymbol{LQ_i = (}$14,234/71,139)/ (108,876/565,557) = 1.039 Given that the LQ > 1, Blacktown manufacturing is more than self sufficient in this industry and has the ability to export.

Readmix plans to employ a total of 267 more workers at the RootyHill RDC so the new Location Quotient for Blacktown Manufacturing

***LQi 14,501/71,406/ 109,143/*565,824 = 1.05** (based on an increase in manufacturing employment of 267). This means that the Manufacturing industry in Blacktown has increased its export ability. (Note that GWS employment in manufacturing and GWS total employment figures excludes Readymix RDC employment effect).

(2) Calculating the Export manufacturing employment multiplier

Surplus or export employment in manufacturing industry ***i*** can be now be computed by the formula

EX_i= (1 - 1/LQ_i)*e_i , LQ_i > 1, = (1 – 1/1.039) X 14,234 = 534.29 (Without Readymix RDC)

EX_i= (1 - 1/LQ_i)*e_i , LQ_i > 1, = (1 – 1/1.05) X 14,501 = 690 (With Readymix RDC)

(3) Calculating the Employment Multiplier for Blacktown

Simple Manufacturing Multiplier for Blacktown is (1 + N/B) = 1 + 50,219/20,920 = 3.4.

N = Non-Basic Employment B = Basic Employment
This (basic/non-basic) employment 'multiplier' is equal to total employment in both basic and service activities divided by total basic employment (Isard, Methods of Regional Analysis, 1960, p, 190).

In defining non-basic and basic categories we rely on an arbitrary assignment of non-basic to basic industries by identifying non-basic industries as activities which are primarily servicing the basic industries. We assigned employment for entire industries into categories by estimating the proportion of employment involved in basic activities.

(4) Calculating the Employment Multiplier for Greater Western Sydney (GWS)

Simple Manufacturing Multiplier for GWS is (1 + N/B) = 1 + 410866/154691 = 3.65.