TOPIC 20
REGIONAL IMPACT
MODELLING

EVALUATION OF THE ECONOMIC IMPACTS OF A HIGHWAY BYPASS: A CASE STUDY OF THE GOULBURN BYPASS

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Abstract

The findings of a study undertaken after the opening of the highway bypass at Goulburn (NSW) are compared with earlier studies about predicted economic impacts of the bypass. Substantial errors are found in the forecasts of earlier studies of the bypass. Problems with forecasting bypass impacts are discussed in the context of future impact assessments of bypass roads.

INTRODUCTION

The construction of highway bypass roads around smaller country towns can be expected to have important economic and social impacts on the communities affected. Although many studies have attempted to document the nature and extent of the impacts of bypasses overseas, to date little is known about their impacts in Australia. The aim of this paper is to contribute to a better understanding of the problem by reporting the findings of a study recently completed which documents the impact of the bypass on the town of Goulburn, New South Wales.

A number of methods have been used to assess the economic impacts of bypasses in previous studies. These include the case study method, the "Survey-and-Control-Area" method, and "Before and After" studies designed to monitor in detail the changes to local economies brought about as a result of bypasses (Parolin, 1994). In many cases, however, it is often only possible to undertake retrospective (or *After*) studies to document the nature and extent of impacts. Few *Before* studies are undertaken except where the construction of a bypass requires the preparation of an Environmental Impact Statement (EIS) to satisfy the requirements of planning legislation (as in NSW). In this case, the emphasis is on the prediction rather than on the monitoring of impacts or empirically determining the actual nature of impacts.

This paper reports the findings of a detailed study undertaken *after* the opening of the bypass at Goulburn. It is based on a questionnaire survey of 198 retail and service businesses in the town which was completed in June and July 1994—approximately 17 months after the bypass was opened in December 1992. The findings from the study are compared with comments made about the likely impact of the bypass on the economic base of the town in the EIS prepared in 1985—some seven years before the bypass was completed, and also with the results of a study undertaken by the School of Geography, University of New South Wales in 1981 which attempted to predict the impact of the bypass on employment and gross annual turnover using forecasting methods.

Background

Goulburn is an important regional centre in south-eastern NSW and has traditionally functioned as a significant service centre for the surrounding region; historically it has played an important role in the agricultural settlement and economic development of the Southern Tablelands. Because of its strategic location on the Hume Highway—the main road between Sydney and Melbourne—208 km south-west of Sydney, Goulburn has also developed as a major centre servicing the needs of motorists stopping and staying overnight in the town on journeys to and from Sydney, Canberra, and during the winter season the ski resorts of the Southern Alps (see Figure 1).

Goulburn's strategic location has been changing, however, following significant improvements to the Hume Highway that have been made progressively since the mid 1970s as part of the federally funded National Highways Program. Under this program, the Hume Highway is being upgraded to four lane freeway standard between Sydney and Melbourne which has involved the construction of bypasses around many of the towns located on the old highway—including the town of Goulburn.

In the ten year period prior to the opening of the bypass, the town of Goulburn has also undergone considerable structural changes to its economic base. Population growth has been fairly static over the last 20-30 years. In 1971 Goulburn had a population of 22,150 compared to 21,451 in 1991—an increase of only just over 3 per cent during the 20 years.

Factors which have contributed to this low rate of population growth include the declining importance of the town as an agricultural service and wool marketing centre, the growth of nearby Canberra as an high order service centre for the region, and the rationalisation of public sector services (Telecom, Public Works, State Rail, etc) (EEAWP 1994).

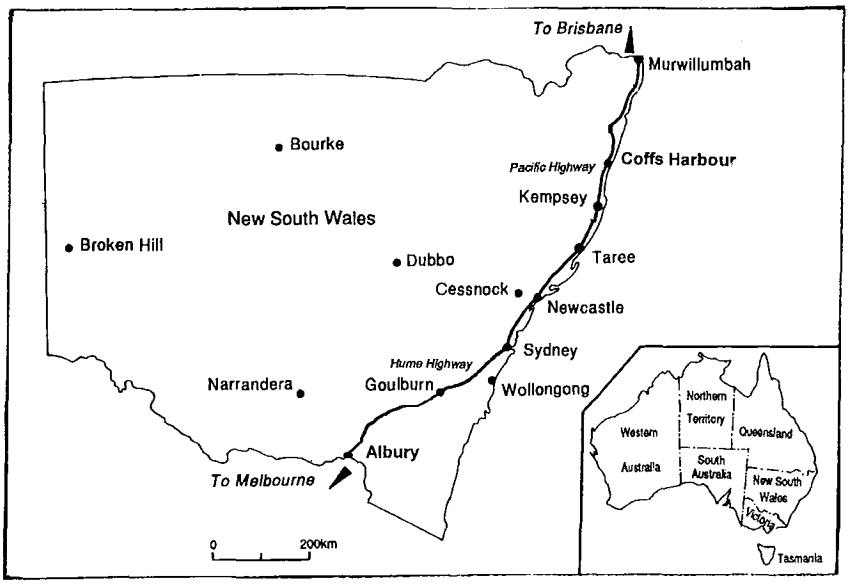

Figure 1 Study site: Goulburn

The restructuring of State Rail, in particular, has contributed to the decline of Goulburn as a significant rail centre. During the 1986-91 Census period, employment in rail transport fell by nearly 400. When this reduction in employment is added to those of other government departments, upwards of 800 jobs may have been lost in the 1980s in the public sector of Goulburn before the opening of the bypass.

The growth of Canberra has also played a part in the marginal decline of Goulburn, providing strong competition in the provision of higher order goods, services and facilities. The leakage of expenditure to Canberra from Goulburn has been a contributing factor in the closure of some businesses and loss of local employment, and it is now widely recognised that Goulburn's role as a major regional centre has been surpassed by the nation's capital.

The contraction of the economic base of the town resulting from these developments has been compounded by the effects of the improvements to the Hume Highway—effects that were being felt prior to the opening of the bypass itself. The net effect of these improvements (together with new bridges, road straightening and widening) has been to bring about a significant time-space convergence resulting from an increase in average speeds and a reduction in travel times. Goulburn is now only a one and a half hour drive from the outskirts of Sydney compared to almost three hours in 1975.

The reductions in travel time have caused motorists to re-assess their stopping and staying behaviour. In a recent study, undertaken before the opening of the Goulburn bypass, it was found that while Goulburn continues to be a major stopping point for motorists on the Hume Highway, more motorists were now stopping at Yass rather than Goulburn, and that about 21 per cent of those stopping at Yass were doing so for the first time (McKenzie 1992). The findings from this study suggest that Goulburn had been losing highway-generated trade to Yass, and also to the recently constructed service centres located on the upgraded highway itself (Pheasants Nest, Sutton Forrest and Marulan), even before the opening of the bypass.

The Goulburn study

Against this background, the opening of the bypass was viewed with some concern by the local businesses. The Chamber of Commerce in particular was keen to ascertain the extent to which the bypass had actually affected the business community and this indirectly stimulated an interest in documenting the impact of the bypass from the results of an extensive survey of local businesses.

Initially, a total of 275 business establishments were selected for inclusion in the survey of which 35 (12.8 per cent) declined at the outset to participate—including 10 that had opened just before or just after the bypass opened and hence were not in a position to provide realistic information. A questionnaire and cover letter were mailed out to businesses which were asked to complete the questionnaire, which was then collected by the research team and used as the basis for an interview with managers or proprietors.

Of the 240 businesses subsequently included in the survey, 24 (8.7 per cent) failed to complete the questionnaire and 18 provided information for all of their business establishments on the same questionnaire. Consequently, the statistical analysis is based on information provided by only 198 businesses. The overall response rate was 78.5 per cent which is very high for this kind of survey.

The 198 businesses included in the survey have been aggregated for analysis and the presentation of results in the Tables in this paper into five broad major functional categories which generally conform to those identified in the Australian and New Zealand Standard Industrial Classification (ANZSIC). The categories are food services, retail services, auto services, cafes, restaurants, and accommodation. These categories are then used as a framework for assessing the impact of the bypass on gross annual turnover and employment (changes in the way business is conducted, and changes in the pattern of linkages with other firms in the local area and beyond were also examined but are not reported in this paper). The figures presented in the Tables relate only to the impact of the bypass: businesses were asked to separate out the effects of other factors (eg the downturn resulting from the recession) in completing the questionnaire.

Extensive consultation was made with members of Goulburn City Council, the Chamber of Commerce, and the Business Enterprise Centre regarding the structure of the questionnaire and the businesses to be included in the survey. There was general agreement that businesses on the Main Street and those located on side streets adjacent to it as well as selected businesses along the highway on either side of the town should be included as these would be the businesses most likely to be affected to varying degrees by the bypass. Not all businesses in the centre of the town were, however, included. Based on the classification used in the *Directory of Businesses* participating in the Great Goulburn House and Land Giveaway (a promotion by local businesses and the.Goulburn Mainstreet Committee), all of the businesses in the following categories were excluded: accountant/financial services, banks, building/painting/home improvements, business supply companies, engineering firms, equestrian/garden/pet supplies and services, general stores, hairdressers, insurance companies, optometrists, plumbers, professional services, real estate, recreation/travel, solicitors, speciality services, and supply companies.

THE DIRECT IMPACTS OF THE GOULBURN BYPASS

Impacts on gross annual turnover

Table 1 summarises the extent of changes to gross annual turnover directly attributed to the opening of the bypass for the five major business categories. Of the 173 businesses providing information, 90 (52 per cent) indicated that the bypass had had no effect on turnover at all. Most businesses in this group are establishments in the auto services and retail services categories that are not so highly dependent on passing trade. A further 12 businesses (7 per cent) reported an increase in turnover—the majority of which were in the retail services, food, and accommodation categories.

Table 1 Change in turnover because of the bypass, by business sector

Change in turnover	Food Services	Retail Services	Auto Services	Cafes/ Clubs	Accom-modation	Total N	Total %
Minimal impact Decreased less than 10%	5	12	5	3	1	26	13.1% (36.6%)
Moderate impact Decreased 10-19%	5	7	3	3	2	20	10.1% (28.2%)
Serious impact Decreased 20-29%	5	1		3	1	10	5.1% (14.0%)
Serious impact Decreased 30-39%	1	2	1	3		7	3.5% (9.9%)
Very serious impact Decreased 40-49%	2		2	1		5	2.5% (7.0%)
Decreased more than 50%						3	1.5% (4.3%)
No Change	11	44	22	8	5	90	45.5%
Increased	2	7		1	2	12	6.0%
Not Stated	4	12	4	5		25	12.6%
Total Businesses	36	85	38	28	11	198	100%

Note:
Percentages in brackets are those relating to the 71 businesses that reported a decrease in turnover because of the bypass.

The remaining 71 businesses (41 per cent) claimed to have been negatively affected in varying degrees because of the bypass and for these the magnitude of the decrease in gross annual turnover is clearly related to the extent to which they relied on passing trade. For example, the 8 businesses which have been *very seriously* affected (a decrease in turnover of 40 per cent or more) are clearly dependent on highway-generated trade and include take-aways, service stations, cafes, and restaurants. One of the service stations, a cafe, and a specialised food outlet experienced more than a 50 per cent reduction in turnover. Seventeen businesses had been *seriously* affected as a result of the bypass—largely establishments in the food services and cafes-restaurants, and the balance reported a reduction in turnover of less than 20 per cent (*minimal* or *moderate* impacts).

It should be noted that establishments in the accommodation category experienced relatively lower decreases in turnover because of the bypass (only four of the eleven motels reported a decrease in turnover). This suggests that occupancy rates, guest nights and takings have generally not declined as dramatically as expected since the opening of the bypass—a result confirmed in a preliminary assessment of tourist accommodation data for Goulburn from the Australian Bureau of Statistics (ABS).

The total dollar value of the reduction in gross annual turnover can be calculated by relating the figures shown in Table 1 to the estimates of gross annual turnover for 1991 (ie *before* the opening of the bypass) provided by businesses as part of the survey. The result suggests that gross annual turnover had decreased by $13.1 million between 1991 and 1993, that is by about 9 per cent. The total value of turnover in 1991-92 for the five major business categories was estimated to be $255 million from the ABS Retail and Services Census. In this context, the decrease in turnover ($13.1 million) only represents a 5.1 per cent decline in turnover over official 1991-92 figures.

Impacts on employment

The opening of the bypass has not created a serious unemployment problem in Goulburn (Table 2). The number of persons laid-off because of the opening of the bypass is very small (58) and represents only 3.7% of the total employed by the 198 businesses surveyed and less than one per cent of employed persons in Goulburn reported in the 1991 ABS Census of Population and Housing.

Table 2 Employment loss because of the bypass

Employees	Total	Percent of Total
Full-time	13	22.4
Part-time	22	37.9
Casual	23	39.6
Total	58	100.0

As might be expected, most of those laid-off (45 persons) were part-time and casual employees (77.5% of the total). However, it can also be expected that some of these individuals, as well as some of the 13 in full-time and part-time employment who have lost their jobs, will have been re-absorbed into the local economy of Goulburn since 1992. Only 2 (3%) of the 58 employees laid-off lived outside Goulburn.

The loss of full-time jobs has occurred in each of the five major business categories, except for accommodation. The largest number, by far, of part-time and casual employees laid-off were in highway-related business activities, namely take-aways, cafes and restaurants, and service stations—a not unexpected result given the high dependence of these businesses on passing trade.

To keep job losses associated with the bypass in perspective, it should be noted that only 21 out of 171 businesses (12.3%) that experienced a decrease in turnover laid-off staff because of the bypass. There is however no correlation between the magnitude of reduction in turnover and the number of jobs lost. This compares with 51 businesses that reported a decrease in turnover (30%) because of the bypass which did not retrench workers (Table 3). Therefore, twice as many businesses that were negatively affected by the bypass had not put-off workers, although most of these experienced lower levels of downturn in turnover relative to those which put-off workers. Apparently, these businesses have been able to absorb the reduction in turnover due to the bypass without laying off workers.

Table 3 Employees laid-off because of the bypass, by change in turnover

Change in turnover because of the bypass	Employees laid-off because of the bypass		Total
	Yes	No	
Decreased less than 10%	2	24	26
Decreased 10-19%	4	14	18
Decreased 20-29%	1	9	10
Decreased 30-39%	4	3	7
Decreased 40-49%	5	-	5
Decreased more than 50%	2	1	3
No Change	-	90	90
Increased	-	12	12
Total Businesses	18* (10.5 %)	153 (89.5%)	171 (100%)

Note:
A total of 27 businesses did not provide information on employees laid-off *and* the extent of changes in turnover.
* Three businesses did not provide details on changes in turnover.

Reductions in working hours of staff

Although businesses may not have had to actually retrench workers, it is likely in many cases that hours of work have had to be reduced. This turns out not to have been the case however. Only a very small number of businesses (26) actually reduced hours worked by their employees (Table 4), and just under three quarters of these are in highway-related categories (take-away foods, service stations, cafes, restaurants, and pubs). None of the establishments in the accommodation sector

had to reduce hours worked by staff—a further indication that this sector has been less affected relative to businesses in other highway-related categories.

Table 4 Reduction in staff working hours because of the bypass by business sector

Reduced Working Hours	Food Services	Retail Services	Auto Services	Cafes/ Clubs	Accom-modation	Total	
						N	%
Yes	7	7	6	6	-	26	13.1%
No	24	73	29	18	10	54	77.8%
Not Stated	4	5	4	4	1	18	9.1%
Total Businesses	35	85	39	28	11	198	100%

There is, as might be anticipated, some association (Rs=0.70) between businesses that reduced staff working hours and the size of the reported decrease in turnover because of the bypass. In general, more businesses which reduced staff hours experienced a lower level of decrease in turnover (Table 5). For example, 9 out of the 23 businesses (39.1%) which reduced staff working hours were only minimally or moderately impacted by the bypass, 10 (43.5%) were seriously impacted, and only 4 (17.4%) were very seriously affected. Further, a total of 20 out of the 23 business (83%) establishments which reduced working hours were middle and high turnover businesses. It appears that as many businesses reduced working hours as those that did not as a way of adjusting to the effects of the bypass.

Table 5 Change in turnover and reduced working hours because of the bypass

Change in turnover because of the bypass	Reduced working hours because of the bypass		Total
	Yes	No	
Decreased less than 10%	4	22	26
Decreased 10-19%	5	13	18
Decreased 20-29%	5	5	10
Decreased 30-39%	5	2	7
Decreased 40-49%	3	1	4
Decreased more than 50%	1	1	2
No Change	-	90	90
Increased	-	12	12
Total Businesses (%)	23 (14.1%)	146 (85.9%)	169 (100%)

Note:
A total of 29 businesses did not provide information on reduced staff working hours *and* the extent of change in turnover.

The figures in Table 6 show that only 12 businesses (6.6%) had to reduce working hours *and* lay-off workers as a result of the bypass. Five of these businesses were service stations, two were cafes and restaurants, and the remainder also highway related businesses (eg take-aways). Five of the 12 businesses (42%) are located at the southern (Melbourne) end of town, 4 (33%) are located at the northern (Sydney) end of town, with the remaining 3 businesses being located on the Main Street.

From information gained from the survey, it appears that those businesses which both laid-off staff and reduced working hours have a different profile to those which reduced hours but did not have to put-off staff. The former are clearly traditionally highway oriented businesses, mainly located at both ends of Main Street, and which experienced a more severe downturn in turnover. In contrast, the latter businesses are more diversified (6 out of 14 would not generally be considered as being highway-oriented); are located directly on the Main Street and its northern edge, and experienced a lower level of reduction in turnover due to the bypass.

Table 6 Reduced working hours and employees laid-off because of the bypass

Employees laid-off because of the bypass	Reduced working hours because of the bypass				Total
	Yes		No		
Yes	12	(6.6%)	8	(4.4%)	20
No	4	(7.7%)	146	(81.1%)	160
Total Businesses	26		154		180

Note:
Figures in brackets are percentages of the total number of businesses that provided information on the number of workers laid-off *and* reductions in staff working hours (180 out of 198 businesses).

COMPARISON OF THE RESULTS WITH PREVIOUS STUDIES

The Goulburn bypass EIS

The assessment of economic and social impacts of developments is a mandatory requirement in the preparation of all EISs in NSW. The extent to which these impacts are treated varies considerably, however, despite the fact that they are often as significant—if not for many developments more so—than the impacts on the natural environment. In most cases, the depth of treatment of the socio-economic impacts leaves much to be desired and this is very much the case with the EIS prepared for the Goulburn bypass (Sinclair Knight & Partners 1985).

In the four pages in the EIS devoted to economic effects, it was argued that the bypass would have little if any direct effect on employment in the town (indirect effects were not considered) although no figures supporting this claim were presented. Neither was any quantitative estimate given for the impact of the bypass on gross annual turnover because, it was argued, this would be unlikely to change.

This was considered to result from the fact that Goulburn is both at such an important strategic location on the Hume Highway and is of sufficient size "to minimise any potential loss of highway trade after the bypass is opened" (p 7.25), and that if there were to be a reduction in the number of vehicles stopping at Goulburn, the effect would most probably only be minor—and indeed "there is sufficient evidence to suggest that in fact there may be an *increase*, especially once the full length of the upgraded Hume Highway is completed" (p 7.25).

The logic supporting this view was that the total volume of highway trade generated at all the various towns along the highway cannot decrease dramatically because of the demand from motorists for fuel, food and rest facilities must continue to be satisfied after the construction of bypasses. Thus highway trade will continue to flow to all of the towns that have traditionally serviced the needs of motorists on the highway. Consequently, Goulburn would only lose part of its existing share of the total trade if there was a substantial increase in highway-generated trade at one of the other towns.

Even if this were to be the case, it is suggested that there would in any case be a compensating shift in trade to Goulburn from other towns along the highway. Thus, for example, although the reduced travel times from Sydney might cause some motorists travelling in a southerly direction to stop at Yass in future rather than at Goulburn, the resulting loss of trade would be made up because it was likely that Goulburn would win trade from motorists bypassing Mittagong.

It was further argued that if there were to be a loss of turnover in the services sector at Goulburn caused by the bypass, this would be offset in part by the economic gains to the town (directly and indirectly) resulting from bypass construction activity. It is difficult, however, to follow the logic of this argument given the fact that the economic benefits flowing from construction would be experienced prior to the opening of the bypass and would end very shortly afterwards.

That the expenditures by construction workers and contractors on a wide range of goods and services at local businesses were significant during the construction phase is well documented and

was frequently referred to in discussions with businesses in the course of collecting the data for our study. The benefit of these additional expenditures on gross annual turnover and employment most likely has been to offset the effects of the downturn in business due to the recession on the one hand, and to generate excess profits at some businesses on the other. It is difficult to comprehend how benefits accruing *before* the opening of the bypass are capable of mitigating the economic impact of the bypass *after* it has opened.

The Phibbs study

This study, which was commissioned by the Goulburn and District Chamber of Commerce in response to concerns expressed by members of the business community, set out to assess the economic impact of the bypass. The study was conducted between 1978 and 1981 when it was believed that the bypass would be opened in 1988 (Phibbs et al. 1981). The principal objective of the study was to quantify the likely impact of the bypass on total employment and gross annual turnover directly and indirectly for both the short- and long-term using forecasting methods.

In the study it was estimated that after the bypass opened, only 45 per cent of vehicles previously stopping at Goulburn would continue to do so (compared to the assumed 67-100 per cent in the EIS). Given that some compensatory effects were expected as a result of subsequent re-adjustments in the behaviour of motorists travelling the highway, this was predicted to increase to 80 per cent in the longer-term.

From data collected on average expenditures made by stoppers and stayers in the town, the loss in highway-generated trade was calculated to be between $5.5-7 million annually immediately after the bypass opened—a reduction of 45 per cent. It was argued, however, that this would fall to $1.6-2.3 million (1978 prices) in the longer-term due to the anticipated increase in the number of motorists stopping in the town to result in the net reduction in turnover of 15-18 per cent.

The expected decrease in the value of highway-generated trade was translated into loss of jobs using an employment-turnover function. Initially, the effect of the bypass was predicted to result in a total loss of 165-210 jobs—the largest component of which would result from the decrease in motorists stopping at Goulburn (117-155 jobs) and the balance (48-55 jobs) from motorists staying overnight. In the longer-term, however, the net reduction in employment was forecast to be considerably smaller—between 49-67 jobs—virtually all of which would be at businesses servicing the needs of motorists stopping in the town.

The indirect and induced employment impacts of the bypass were calculated using a Type II multiplier (the ratio of direct, indirect, and induced effects to the direct effects) derived from a Keynesian multiplier model. The numerical values of the multiplier were calculated to be 1.44 in the short-term and 1.41 in the long-term. The small values of the multiplier were considered to be due in large part to the weak linkages between establishments in the retail and service sectors and the rest of the Goulburn economy.

Summing the direct, indirect, and induced effects to generate a value for the total effect of the bypass on employment, it was forecast that in the short-term, a total of 237-303 jobs (2.8-3.4 percent of the 1978 workforce) would be lost while the impact in the long-term would be considerably reduced with a net loss of only 69-95 jobs (0.8-1.1 percent of the 1978 workforce).

DISCUSSION

In the 17 months since the opening of the Goulburn bypass, the impact on local businesses turns out to have been relatively small—and certainly of a much lower order of magnitude than generally might have been supposed. This finding is an important one from two viewpoints. First, it provides a rare opportunity to evaluate the validity of statements made about the economic impact of the bypass presented in the EIS. Secondly, the results of the study provide a factual basis for assessing the reliability of forecasts and serve to illustrate the difficulties of making forecasts about bypass impacts.

Towards an environmental audit

It is well recognised that a major deficiency in the planning process is the lack of a requirement for any kind of environmental audit either during or post-development. The accuracy and reliability of predictions made, and the methodologies used, in "*Before*" studies are not assessed because no follow-up monitoring is undertaken to ascertain their validity (Fairweather 1992). The detailed insights gained from studying actual impacts are therefore valuable because they provide a basis for improving the quality of statements made in EISs about the likely effects of bypass impacts.

The prediction in the EIS for the Goulburn bypass that it would have only a minimal impact on employment, because it was unlikely that there would be any substantial reduction in highway trade, does *not* appear in retrospect to be justified given that the post-bypass surveys have documented a loss of 58 jobs and a reduction in gross annual turnover of the order of $13.1 million—notwithstanding the fact that these figures are smaller than might have been expected.

The difference is undoubtedly due to a flaw in the logic of the argument about the stability of stopping patterns along the Hume Highway used as a basis for the predictions in the EIS. As it turns out, these have not remained the same; rather there has been a substantial change in motorist behaviour since the EIS was prepared in 1985. Evidence documenting this has been presented in the study undertaken at Goulburn prior to the opening of the bypass (McKenzie 1992) referred to in the Introduction to this paper. Yass has certainly gained at the expense of Goulburn—as postulated in the EIS; whether or not the loss has been made up by the transfer of trade from other towns is unclear, but unlikely to have occurred.

Data obtained from number plate surveys of vehicles along the Hume Highway between Yass and Goulburn undertaken in 1993 and 1994 before and after the opening of the bypass at Yass indicate that as much as 85 per cent of traffic travelling in both directions on the Hume Highway now bypass Goulburn. There is certainly no evidence thus far to suggest that the number of motorists stopping at Goulburn has increased as postulated in the EIS. In fact the proportion of motorists now coming off the bypass to stop in the town is well below that forecast in both the EIS and in the Phibbs study.

The principal reason for this is undoubtedly the effect that the opening of three service centres situated directly on the upgraded Hume Highway since 1990 has had on motorists stopping patterns. At the time the two earlier studies were completed, the policy of the then Department of Main Roads (now the NSW Roads and Traffic Authority) did not permit the construction of service centres near established settlements—a policy that was subsequently reversed. There can be no doubt that the new service centres have intensified the impacts of the bypass at Goulburn as well as at other bypassed towns (eg Mittagong, Berrima, and recently Yass).

As a result, a considerable part of the total trade that might otherwise have been retained by towns along the Hume Highway is being syphoned off now by the new service centres. It remains to be seen whether the adjustments to driver behaviour hypothesised in the Phibbs study will occur and result in an increase in the number of motorists stopping at Goulburn. Information obtained during the course of the recent survey of businesses in Goulburn suggests that, compared to the situation immediately after the opening of the bypass, the number of motorists stopping in the town is increasing again although given the anecdotal nature of the evidence it is not possible to quantify the extent to which this is the case—or whether indeed it is the case at all.

The complexities of forecasting

The considerable difference between the actual impacts of the Goulburn bypass on turnover and employment documented in this paper and those predicted in the Phibbs study serve to illustrate the difficulty of, and complexities involved in, making reliable forecasts of bypass impacts. Although the reduction in gross annual turnover made by Phibbs may not be entirely inconsistent with what actually appears to have occurred if the dollar values are pro-rated to current prices, there is no doubt that the forecasted impact of the bypass on employment made in that study was grossly exaggerated.

The documented loss of only 58 jobs directly in the 17 months since the bypass opened represents only about one-third of the total job loss predicted in the earlier study in the short-term although the actual figure corresponds reasonably well with the net loss of between 49-67 jobs in the longer-term.

It is difficult in retrospect to identify the reason for predicting that the bypass would result in such a large impact on employment because exact details of the numerical calculations are not contained in the original study. It would appear, however, that there was an error in formulating the employment-turnover function used to calculate the direct effect of the bypass on employment.

In addition, the predicted loss of jobs due indirectly to the bypass was clearly overestimated in the Phibbs study. This was probably due to errors in calculating the numerical value of the coefficients used in the Keynesian model to result in an inflated numerical value of the Type II multiplier. The fact that a Type II rather than a Type I multiplier was used would in any case magnify the indirect employment effect and there is little if any evidence suggesting that the actual loss of jobs has been associated with more than minimal induced effects.

The results from the recent surveys at Goulburn also indicate the need to, and importance of clearly distinguishing between the effects on the accommodation sector and those on other retailing and services businesses in bypass impact studies. In the case of Goulburn, it is clear that the most important effects on employment and turnover result from the reduced number of motorists stopping in the town and to a much lesser extent on the number of travellers staying overnight. Whereas the new service centres have obviously had a significant affect on motorists stopping patterns along the highway, they cannot have affected staying patterns because they do not provide accomrnodation facilities. Any changes to the pattern of overnighting must be due therefore primarily to the effects of time-space convergence brought about by in part by the construction of bypasses rather than the construction of service centres *per se*.

The Phibbs study had forecast that up to 43 jobs (high estimate) would be lost in the short-term in the accommodation sector from reductions in the number of overnight stayers following the opening of the bypass. In the longer-term it was anticipated that the accornmodation sector would recover strongly from the opening of the bypass, and this was reflected in the expected net loss of five jobs in this sector. As reported previously, the post-bypass surveys recorded no job losses in the accommodation sector, and most establishments in this sector experienced relatively lower decreases in turnover because of the bypass.

It would appear that Goulburn remains an important location for travellers staying overnight. Anecdotal evidence from motel proprietors collected during the course of the post-bypass surveys indicates that tourists and holiday-makers, especially from Victoria, are continuing to stay overnight (or longer) in Goulburn as are travelling sales persons and business persons. It was also mentioned that there occurred periodic accommodation shortages in Goulburn due to demand associated with major sporting and social events for which Goulburn was now recognised, and as a result of accommodation shortages in Canberra associated with major festivals and school holidays.

CONCLUSION

Since 1980, a total of 14 towns and villages have been bypassed as part of the progressive upgrading of the Hume Highway. To date, however, little is known about what the impacts of these have been on the economic base of the communities affected. The results of the study reported in this paper—the *first* undertaken in Australia to empirically document the actual impacts of a bypass on a local economy, are therefore significant. The findings are of both intrinsic interest and practical value to decisionmakers and policymakers, especially for the preparation of EISs given it is expected in the coming decade that a further 10-15 towns will be bypassed in NSW in connection with upgrading of the State's arterial road network.

The results of the survey of businesses at Goulburn indicate that the bypass has not resulted in a significant loss of employment. Only 58 jobs have been lost—a very small proportion among the

businesses surveyed; close to half of those made redundant were casually employed. Many more businesses affected by the bypass have reduced the hours worked rather than lay-off staff. Several businesses, especially those dependent on highway-generated trade, have experienced a reduction in turnover since the bypass opened—the total loss of which amounts to about $13 million annually or about 5 per cent of the value of retail trade within Goulburn. A number of businesses are at risk of closure and a number of takeaways are for sale suggesting that the impact of the bypass has not yet run its full course. These findings should be read in the context of other factors which have inhibited the growth of Goulburn, ie State Rail restructuring, the relative attractiveness of a growing Canberra and a general decline in the town as a service centre.

That the findings from the survey of businesses in Goulburn are different to what was predicted in the EIS, and are totally inconsistent with the forecasts made in the Phibbs study, clearly indicate that much still has to be learned about the processes affecting motorists' stopping and staying behaviour and that a better understanding is required of the workings of the economies of small towns. Without this, it is unlikely that the accuracy of forecasts and predictions of bypass impacts will be improved and hence made more meaningful in the policy context. The results of the research reported in this paper must be seen as making a useful contribution towards achieving this goal.

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