East of Lewes Strategy Development Plan
South Coast Corridor Multi-Modal Study
Prepared for
Government Office for the South East
August 2002

Halcrow Group Limited
In association with:

- Accent
- Chris Blandford Associates
- DTZ Pieda
- Baxter Eadie Ltd
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South Coast Corridor Multi Modal Study
East of Lewes Strategy Development Plan

Contents Amendment Record

This report has been issued and amended as follows:

Issue	Revision	Description	Date	Signed
1	1	Incorporating comments from Steering Group	18/8	SCC

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1 Introduction

1 Introduction

1.1 ***Background to the Strategy Development Plan***

1.1.1 The South Coast Corridor Multi Modal study (SoCoMMS) is being undertaken on behalf of the Government Office for the South East (GOSE). The study has developed a transport strategy for the South Coast between Southampton and Thanet. This in turn will be an important element of the Regional Transport Strategy being developed by the South East Regional Assembly.

1.1.2 The development of the transport strategy has made use of a strategic transport model, which has been specifically developed for SoCoMMS. The model represents an average hour between 0700 and 1900 and includes highway and rail network definitions. Travel forecasts have been developed for 2016 and 2030. A range of transport measures have been tested, either in isolation or in combination. The outputs from the strategic model have provided valuable information for the development of a transport strategy for the south coast.

1.1.3 The transport strategy that has emerged includes a range of interventions:

- local initiatives (public and private sector);
- local public transport improvements;
- strategic public transport improvements;
- targeted road improvements;
- freight initiatives;
- safety and mobility initiatives; and
- balance - demand management.

1.1.4 In order to provide further detail on the elements of the strategy, a series of Strategy Development Plans (SDPs) are being prepared. These include plans investigating measures within:

- South Hampshire;
- Chichester;
- Arundel;
- Worthing;
- Brighton and Hove;
- East of Lewes;

- Bexhill-Hastings;
- Local public transport; and
- Rail.

1.1.5 The purpose of the strategy development plans is to investigate the performance of multi-modal measures at the local level. The plans provide a feedback to the strategy development process by confirming the inclusion of key measures. The plans provide greater detail on the measures and their appraisal. The modelling of transport impacts within the SDPs is undertaken for the peak hours. Where appropriate, an AST has been developed.

1.2 The East of Lewes Strategy Development Plan

1.2.1 This Strategy Development Plan covers the area East of Lewes. In particular, the Strategy Development Plan relates to travel between Eastbourne/Polegate and Lewes along the A27.

1.2.2 Within the area covered by this Strategy Development Plan area are the schemes at Selmeston and Wilmington which were remitted to SoCoMMS by the New Deal for Transport (1998). In addition, there is also consideration of the Southerham-Beddingham level crossing.

1.2.3 The key issues to be considered as part of this Strategy Development Plan are to:

- assess relationship between developments and highway performance;
- review improvements on A27 and their impact;
- provide information on standard of route required; and
- provide appraisal of alternatives.

2 Current Travel Condition

2 Current Travel Conditions

2.1 ***Introduction***

2.1.1 This section of the report outlines the current travel conditions within the East of Lewes corridor. This analysis draws on data collected from a wide range of sources from the local authorities, transport operators and other survey information.

2.2 ***1998 Neighbourhood Statistics***

2.2.1 The Office of National Statistics' (ONS) website was accessed for demographic data. Table 2.1 presents the district summaries for the districts in East Sussex. The districts within the East of Lewes area have the highest car ownership in East Sussex. Wealden District has the highest car ownership of all the districts.

District	Population	Households	Employment	% households with 0 cars	cars/ household
Eastbourne	87,903	40,499	33,712	34	0.89
Hastings	79,454	35,521	33,460	35	0.89
Lewes	83,583	38,999	36,487	22	1.07
Rother	88,587	40,551	30,243	22	1.12
Wealden	138,937	61,293	54,230	16	1.30
EAST SUSSEX	**478,464**	**216,163**	**188,132**	**25**	**1.08**
Brighton & Hove	250,327	114,757	120,175	39	0.83

Table 2.1: Demographic Data Summary for Districts Within East Sussex

2.3 ***Travel Movements- Journey to work***

2.3.1 An updated database of movements has been developed for the DTLR for use in multi-modal studies using 1991 Census journey-to-work information. These data were updated to 1997 on behalf of the DTLR to reflect population and employment changes. This database has been obtained for use in the SoCoMMS study.

2.3.2 The trip matrices inherent to the database reflect an average weekday daily matrix of person movements. They provide separate origin-destination information for each mode, segregated by car availability (i.e. households with no car available, one car available, or with two or more cars available). Table 2.2 shows the mode share

of commuting journeys within the East Sussex area. The table shows that within the Lewes and Wealden districts over 70% of commuting journeys are made by car. This is higher than for the SoCoMMS study area as a whole.

Area	Rail	Bus	Car	Pedal cycle	Walk	Total
Brighton and Hove	4%	15%	61%	2%	18%	100%
Eastbourne	2%	9%	59%	4%	16%	100%
Hastings	1%	6%	72%	1%	20%	100%
Lewes	3%	4%	73%	2%	18%	100%
Rother	1%	3%	73%	3%	20%	100%
Wealden	1%	2%	77%	2%	18%	100%

Table 2.2: Journeys to Work in East Sussex(Source DTLR Journey to Work data)

2.4 ***Bus***

2.4.1 Bus timetable data has been assembled from local bus guides published by East Sussex County Council, bus operators, and from the Great Britain Bus Timetable. To the east of Lewes there are three corridors of east-west bus services, based on the A27, A259 and the B2124. Table 2.3 summarises the key inter-urban bus routes along this section of the South Coast corridor.

2.4.2 The services which operate along the A27 corridor provide local services to the villages along the route. There are few end to end services along the A27 as these would be in competition with the rail service. Route 125 runs along the A27 between Lewes and Drusillas Corner and then serves Alfriston. This service provides 6 buses per day with the first service leaving Alfriston at 0800 and the last bus back from Lewes being at 1730. There is no Sunday service for this route. On Saturdays, the route is operated with low floor buses. Route 126 operates from Eastbourne and Polegate, through Wilmington to Drusillas Corner, Alfriston and Seaford. This service provides 5 trips per day with the first bus from Wilmington being 0800 and 0900 to Seaford and Eastbourne respectively. The last bus from Eastbourne is 1730 and from Seaford at 1828.

2.4.3 The main east west corridor for bus services east of Lewes is along the A259 where the coastal route 712 operates. This provides 4 buses per hour along the A259 linking Brighton, Newhaven, Seaford and Eastbourne. In addition on Sundays and Bank Holidays routes 713 and 714 operate serving Beachy Head. There is also the National Express route 315 which provides a service along the South Coast from Eastbourne to Cornwall (1 trip per day).

2.4.4 To the north of the A27, routes 20 and 21 provide a service between Lewes and Hailsham via Ringmer. Route 20 provides two morning peak trips from Hailsham to Brighton (at 0755 and 1005) with two return trips in the afternoon at 1330 and 1715. Similarly, route 21 provides a connection between Lewes, Ringmer and Eastbourne with two morning services to Eastbourne at 0907 and 1207 from Lewes with the return trips from Eastbourne at 1035 and 1335.

2.4.5 The other services in the area are the Cuckmere Community services. During weekdays there are limited services operating from Berwick railway station to Selmeston, Wilmington, Seaford and Eastbourne. In addition, there is the Cuckmere Valley Ramblerbus which operates from Berwick station on Sundays and Bank Holidays. This provides an hourly service (between 1012 and 1712) providing a link to the South Downs AONB at Alfriston, Seaford, Severn Sisters Country Park and Wilmington.

2.4.6 In addition to the east-west services, there are north-south routes operating between Lewes and Newhaven (route 123) and between Eastbourne and Hailsham (routes 51,52,53, 98 and 281).

Bus Route	Operator	Weekday frequency	Saturday frequency	Sunday Frequency
125 Lewes- Berwick- Alfriston	RDH Services/ Renown Coaches	6 per day	5 per day	No service
126 Seaford- Alfriston- Polegate-Eastbourne	Renown Coaches	5 per day	4 per day	No service
315 Eastbourne – Seaford- Brighton-Helston	National Express	1 per day	1 per day	1 per day
712 Brighton- Newhaven- Seaford- Eastbourne	Brighton & Hove Buses/ Stagecoach East Sussex	4 per hour	4 per hour	21 trips per day
713/714 Brighton- Newhaven- Seaford- Beachy Head- Eastbourne	Brighton & Hove Buses	0 service	0 service	5 per day
20 Brighton- Lewes- Ringmer- Hailsham	Stagecoach East Sussex	2 per day	2 per day	No service
21 Lewes- Ringmer- Hailsham- Eastbourne	Eastbourne Buses	2 per day	No service	No service
Cuckmere Community Bus Berwick- Selmeston- Wilmington- Seaford	Cuckmere Community Bus	2 per Tuesday 1 per Friday	No service	No service
Cuckmere Community Bus Berwick- Selmeston- Wilmington- Eastbourne	Cuckmere Community Bus	2 per Thursday	No service	No service
Cuckmere Valley Rambler Bus Berwick- Alfriston- Seaford- Wilmington- Berwick	Cuckmere Community Bus	No service	No service	8 trips per day

Table 2.3 : Key Bus Services along South Coast Corridor

(Source- 2001 National Bus Timetable and Local Authority/Operator timetables)

2.4.7 Table 2.4 shows the number of buses serving each of the villages on the A27. This shows that the villages are served by a combined total of 12 buses per day in both directions. In summary, bus services provide occasional services to the villages along the A27 with a limited range of destinations.

Village	***Weekday***	***Saturday***	***Sunday***
Beddingham	12	10	0
Selmeston	12-14	10	0
Wilmington	10-12	8	8

Table 2.4: Numbers of Bus Services per day in the A27 villages (two-way)

2.5 ***Rail***

2.5.1 There is a railway line between Lewes and Polegate along which the South Central Train Operating Company provides part of the Eastern Coastway service. There are stations at:

- Lewes;
- Glynde;
- Berwick;
- Polegate; and
- Eastbourne.

2.5.2 Along this line a range of services are provided including services between Brighton and Hastings (2 trains per hour on weekdays), as well as between London and Eastbourne (1 train per hour on weekdays), or London and Hastings (1 train per hour on weekdays).

2.5.3 There is a branch line from Lewes to Seaford which caters for local services between Seaford and Brighton (1 train per hour) and Littlehampton and Seaford (1 train per hour). In addition, there is a peak hour service between Seaford and London. There are stations on the branch line at:

- Southease;
- Newhaven Town;
- Newhaven Harbour;
- Bishopstone; and
- Seaford.

2.5.4 The number of trains calling at each station per hour is shown in Table 2.5. This highlights Lewes is the most important station in the area with regard to train frequencies. Lewes has a key role as an interchange hub with services to London, Brighton, Eastbourne and Newhaven/Seaford.

Station	Am peak (0700-1000)	Interpeak (1000-1600)	PM peak (1600-1900)	Evenings	Saturdays	Sundays
Lewes	5	6	5 to 6	3	6 eb	2 eb
Glynde	1 to 2 eb 2 to 3 wb	1	1 to 2	1	1	1
Berwick	1 to 2 eb 2 to 3 wb	1	1 to 2	1	1	1
Polegate	2 to 4 eb 3 to 3 wb	4	3 to 4	1	4	1
Eastbourne	3 to 4	4	3 to 4	2	4	1
Southease	0 to 1 sb 1 to 3 nb	1	0 to 2 sb 1 nb	0	1	1
Newhaven Town	2 to 3	2	2 to 3 sb 2 nb	1	2	1
Newhaven harbour	1 to 3	2	2 to 3 sb 2 nb	1	2	1
Bishopstone	2 to 3	2	2 to 3 sb 2 nb	1	2	1
Seaford	2 to 3	2	2 to 3 sb 2 nb	1	2	1

Table 2.5: Number of Trains calling per Hour (each way)

2.5.5 Where the Lewes-Polegate railway line crosses the A27 trunk road, there is a level crossing. Typically, there are a total of 8 trains per hour using the level crossing. This causes delay to traffic using the trunk road, particularly during the peak periods.

2.5.6 As part of the London Area Transport Survey (LATS), a number of stations in the south east have been surveyed. The data collection has comprised entry counts to the stations. The length of the count varied between stations. Smaller stations were counted for the peak periods only while larger stations were surveyed for 12 or 16 hours. Table 2.6 provides the entry counts for those stations for which data have been provided by the SRA (Strategic Rail Authority). The data shows the importance of Eastbourne and Lewes as trip origins.

Station	Total Am peak (0700-1000)	Total Inter-peak (1000-1600)	Total PM peak (1600-1900)
Eastbourne	658	590	347
Lewes	565	643	393
Glynde	32	Not surveyed	Not surveyed
Newhaven Town	170	82	59
Seaford	296	149	Not surveyed

Table 2.6: Station Entry Counts, South Coast Stations, LATS Surveys 2001

2.6 ***Road***

2.6.1 Traffic levels on motorways and trunk roads in the area are monitored by agents of the Highway Agency (HA). Traffic data have been collated for the A27 sites for 2001 (see Table 2.7) The data show the Annual Average Daily Traffic (AADT) flows at Beddingham level crossing are 29,000 vehicles, while through Selmeston and Beddingham the AADT is 19,900 vehicles per day: The flow on the A26, south of Beddingham, is 11,000 vehicles per day. The counts indicate that there is little traffic turning from the A26 to the A27 towards Polegate.

Location	2001 AADT
A27 Lewes Road, Falmer	64,193
A27 Newmarket, Lewes	50,617
A27 Beddingham Level Crossing	29,094
A26 South of A27	11,355
A27 Polegate, West of A22	19,936
A27 Dittons	18,791
A27 Pevensey Bypass	8,530

Table 2.7: 2001 AADT (Source: Highways Agency)

2.6.2 Table 2.8 shows the average daily flow by month at Beddingham and to the west of Polegate. The Design Manual for Roads and Bridges (Volume 13) provides a classification of roads according to their seasonality index. This is defined as the ratio of the August flow to the corresponding flow in a neutral month.
A comparison between the average daily flow by month for Beddingham and west of Polegate is shown in Table 2.8.

	Average Daily Flow (two-way)	
	Beddingham Level Crossing	**West of Polegate**
Jan	26,518	17,450
Feb	26,876	19,267
Mar	27,627	19,346
Apr	28,528	19,644
May	29,615	20,606
Jun	31,196	21,233
Jul	31,090	21,273
Aug	31,294	21,547
Sep	29,799	20,606
Oct	28,852	20,269
Nov	28,864	19,854
Dec	28,983	18,126
Seasonal Index	1.056	1.045

Table 2.8: Seasonal Profile 2000 (Source: Highways Agency)

2.6.3 The Highways Agency data indicate that since 1996 there has been a 12.5% increase in traffic flow at Beddingham level crossing and an 8% increase at Wilmington. The Highways Agency have developed an indicator called the Congestion Reference flow (CRF),based on a procedure outlined in the Design Manual for Roads and Bridges, Volume 5. This is used in comparison with the AADT to derive the stress factor for a link, which is used as a proxy for journey time reliability. Values greater than 0.75 are generally held to give cause for concern. The CRF for Beddingham level crossing is 21,900 vehicles and the stress factor is 1.33. At Wilmington and Selmeston the CRF is 23,200 such that the stress factor is 0.86. Thus, both sections give cause for concern in terms of travel time reliability, but the bottleneck at the Beddingham level crossing is the most critical. This is reflected by delays in this section.

2.6.4 The traffic levels on the A27 are sufficient to cause severance in the villages.

2.7 ***1998/9 East Sussex Road Side Interview Surveys***

2.7.1 During the course of 1998 and 1999 East Sussex County Council (ESCC) undertook a series of almost sixty roadside interview surveys. The data gathered from these survey sites were fully processed and expanded (according to observed volumes) in the case of each survey site, but apparently never consolidated into

a single trip matrix. On the SoCoMMS study team's request, and in order to analyse local and through trip proportions at strategic points in the County's road network, ESCC provided full survey data for all the survey sites within the study area.

2.7.2 Data were collected on a north-south screenline east of Lewes which included the A27, A259 and B2192. Table 2.9 shows the vehicle proportions at each site. Around 7% of flows on A27 are heavy goods vehicles, compared with only 1% on the A259.

	A27 Sherman Bridge	**B2192 Ringmer Road**	**A259 between Exceat and Friston**
Motorcycle	0.8%	0.2%	0.4%
Car	77.5%	82.7%	87.9%
Light Goods	14.5%	12.4%	10.6%
Heavy goods 2 or 3 axle	6.1%	4.5%	1.1%
Heavy goods 4+ axle	1.1%	0.3%	0.0%

Table 2.9: Vehicle Proportions (Source ESCC)

2.7.3 Table 2.10 shows the proportions of journeys by purpose. This shows that commuting journeys represent between 30 and 40% of journeys. The A259 has a higher proportion of recreation trips.

	A27 Sherman Bridge	**B2192 Ringmer Road**	**A259 between Exceat and Friston**
Home based work	40%	32%	32%
Home based shopping	4%	6%	11%
Home based employers business	2%	0%	2%
Home based other	21%	14%	17%
Employers business (non home)	8%	2%	13%
Non home based other	24%	45%	26%

Table 2.10: Proportions of trips by Purpose (Source ESCC)

2.7.4 The ESCC data were processed to identify travel desire lines along this section of the corridor. These represent movements between 0700 and 1900. In order to estimate the actual amount of "through" traffic travelling the A27/A259 (coastal) corridor on a daily basis, the actual "through" volumes at the six relevant corridor

sites were doubled (to reflect two-way flow) and slightly expanded (to reflect a 24 hour period). An expansion factor of 1.21 was derived from local counts.

2.7.5 Table 2.11 (and Figure 2.1) shows the trip matrices obtained for the site on the A27 between Lewes and Polegate. The study corridor has been broken down into a series of sectors as follows:

- A27 corridor west of Hove (includes West Sussex and Hampshire)
- the area covered by Brighton & Hove, including the A259 coastal route to Newhaven (via Peacehaven);
- an area from Lewes to Eastbourne including Polegate and Seaford;
- Bexhill and Hastings;
- East Sussex within the study area east of Hastings (based on Rye and Winchelsea)
- the Kent area of the study corridor; and
- the 'Area of Influence'.

Sherman Bridge – 24hr	A27 corridor west	Hove, Brighton & Newhaven	Lewes, Seaford, Polegate & Eastbourne	Bexhill & Hastings	Rye & Winchelsea	A259 corridor east of Rye	rest (basically north of corridor)	
A27 corridor west	9	0	1,285	405	60	60	77	**1,896**
Hove, Brighton & Newhaven	0	0	2,251	564	30	74	146	**3,066**
Lewes, Seaford, Polegate & Eastbourne	1,285	2,251	4,534	357	33	4	1,691	**10,155**
Bexhill & Hastings	405	564	357	23	0	0	325	**1,675**
Rye & Winchelsea	60	30	33	0	0	0	9	**132**
A259 corridor east of Rye	60	74	4	0	0	0	25	**163**
rest (basically north of corridor)	77	146	1,691	325	9	25	69	**2,340**
Total	**1,896**	**3,066**	**10,155**	**1,675**	**132**	**163**	**2,340**	**19,427**

Table 2.11: Daily Travel Movements- A27 Sherman Bridge

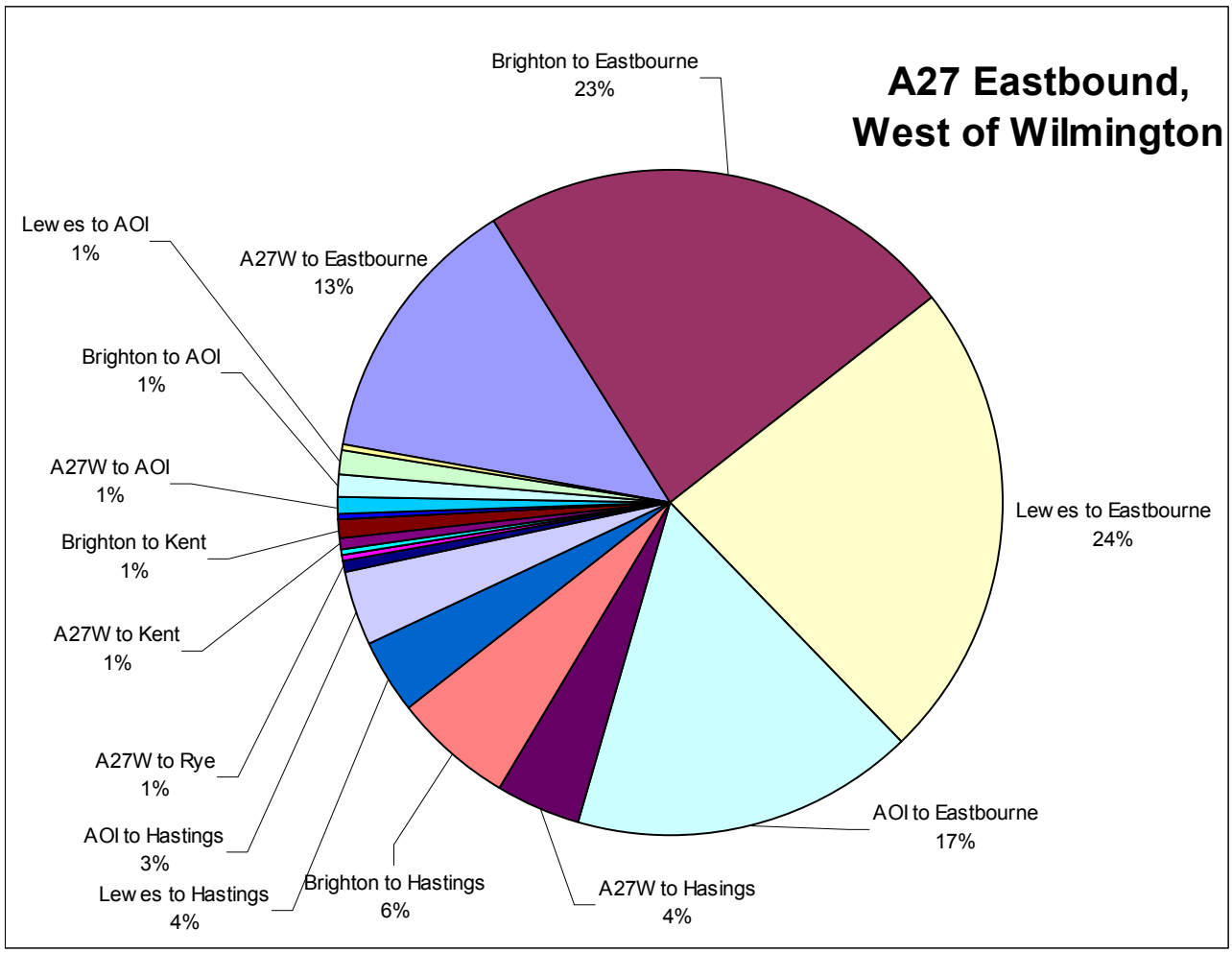


Figure 2.1: Vehicle Movements on the A27

2.7.6 A large proportion of traffic on A27 is local. For example, at Sherman Bridge on the A27 between Lewes and Polegate:

- 24% of movements are local journeys within the sector bounded by Lewes and Eastbourne (e.g. journeys between Eastbourne/Polegate and Lewes);
- 23% of movements are between Polegate/Eastbourne and Brighton/Hove (or vice versa);
- 17% of movements are between Polegate/Eastbourne and the area of influence (e.g. Gatwick);
- 13% of movements are between Polegate/Eastbourne and West Sussex/Hampshire;

- 6% of movements are between Brighton and Hastings;
- 4% of movements are between Hastings and West Sussex;
- 3% of movements are between Hastings and the area of influence;
- 2% of movements are between Brighton and the area of influence; and
- 9% are other movements.

2.7.7 Table 2.12 shows the roadside interview data collected for the B2192 (Ringmer Road) in the westbound interview direction. Around 28% of movements on the B2192 are local, within the Lewes area. At least 436 trips from Eastbourne and Hastings to Lewes and Brighton could have been made on the A27. In addition, there are 535 trips from Hailsham/Polegate which could have been made on the A27. Thus, approximately 26%of flows on the B2192 could have been made on the A27. These vehicles are likely to be avoiding the delays at Beddingham and Lewes.

Origin/ Destination Movement	**Trips**
Local movements within the Lewes area	1055
Lewes to Brighton	732
Bexhill/Hastings to Brighton	140
Eastbourne to Lewes	90
Bexhill/Hastings to Lewes	122
Hastings to Lewes	84
Eastbourne to Brighton	89
Lewes to a27 west	108
Hailsham/Polegate to Lewes	290
Hailsham/Polegate to Brighton	245
Uckfield/Heathfield/Crowborough to Brighton	505
Uckfield/Heathfield/Crowborough to Lewes	337

Table 2.12: Daily Vehicle movements on the B2192 (westbound interview direction)

2.7.8 On the A259 between Exceat and Friston there are 643 trips between Brighton and Eastbourne (see Table 2.13), and a further 171 between Brighton and Polegate. Thus there are potentially a further 1600 two-way trips using the A259 which could use the A27 in the westbound direction.

Origin/Destination Movement	Trips
Newhaven to Eastbourne	2826
Central Brighton to Eastbourne	643
A27 west to Eastbourne	88
Lewes to Eastbourne	145
Haywards Heath to Eastbourne	85
Newhaven to Polegate	535
Central Brighton and A27w to Polegate	171

Table 2.13: Vehicle movements on the A259 (eastbound interview direction)

2.7.9 Thus, in addition to the 20,000 vehicles using the A27 at Selmeston, there are an additional 3,600 vehicles using alternative, more environmentally sensitive routes.

2.8 ***Safety Issues***

2.8.1 Information has been provided by ESCC regarding accidents on the A27. This has been supplemented by data collated from East Sussex Police . Accident data have been collated for the period 1998 to 2001 inclusive.

2.8.2 Table 2.14 shows the number of accidents by sections of the A27. The data shows that the section between Tollgate and Firle has experienced 4 fatalities in that period. In addition, there have been fatalities between Folkington and Polegate and between Southerham to Beddingham. The sections with the largest numbers of accidents are Southerham to Beddingham, Tollgate to Alciston, and Folkington Road to Polegate.

Section	Fatal	Serious	Slight	Total
Southerham Roundabout	0	3	12	15
Southerham to Beddingham	1	6	19	26
Beddingham to Little Dene	0	0	2	2
Little Dent to Tollgate	0	1	1	2
Tollgate to Firle	4	2	17	23
Firle to Charleston Farm Rd	0	0	24	24
Charleston Farm Rd to Common Lane	1	4	11	16
Common Lane to Alciston	0	0	4	4
Alciston to Berwick junction	0	0	6	6
Berwick to Wilmington	0	3	16	19
Wilmington Cross roads	0	0	2	2
Wilmington to Folkington Rd	0	0	5	5
Folkington Road to Polegate	1	2	18	21

Table 2.14: Accident Severity- A27

2.8.3 The national accident rates in 1999 (taken from Table 4.16 of Transport Statistics Great Britain: 2000 edition) are:

- Motorway 11 accidents per 100 million vehicle-kilometres
- All A roads 50 accidents per 100 million vehicle-kilometres

2.8.4 In terms of the numbers of accidents, this section of the A27 has a lower accident rate than the national average.

2.8.5 To identify accident "black spots", where a large number of crashes occurred on a short length of road, locations were determined where either of the following criteria was met:

- 10 adjacent crashes occurred in the three year period at a frequency in excess of 15 crashes/km (approximately twice the average for the whole route); or
- 10 crashes occurred in the three year period at a single location.

2.8.6 Accident "black spots" have been identified at the following locations.

- A27 for 0.5 km east of, and including, the eastern roundabout at Lewes
  14 crashes, with a particularly high proportion of motorcyclist casualties;
- A27 for the 0.5 km each side of the A26 roundabout at Beddingham
  15 crashes;
- A27 at Selmeston
  17 crashes, with a particularly high proportion of KSI casualties; and
- A27 for 1 km west of the A22 at Polegate
  13 crashes.

2.8.7 A key issue for this section are safety considerations at the Beddingham level crossing. This has partial barriers in operation. There have been a number of reported incidents and 'near misses' at this location.

2.9 ***Summary***

2.9.1 The review of existing data has shown:

- The area is one of high car ownership and usage, particularly in Wealden District;
- Traffic flows on the A27 are over 31,000 vehicles per day at Beddingham

- The A27 east of Lewes has traffic levels which generate stress factors in excess of 0.75;
- There are delays between Southerham and Beddingham; and
- There are safety issues along the A27 through Selmeston.

3 Forecasting Approach

3 Forecasting Approach

3.1 ***Introduction***

3.1.1 A hierarchy of transport models have been used to assess the impact of transport schemes in the South Coast Corridor. These include a strategic model which has been developed using EMME/2 software to represent travel networks across the south east from Southampton to Thanet. In addition, use has been made of local morning peak SATURN models such as the Wider area Hastings model.

3.2 ***The SoCoMMS Strategic Model***

3.2.1 A strategic transport model has been developed for the SoCoMMS study with the aim of testing a range of schemes, policy measures, and strategies within the study area. The model is multi-modal in nature in that it has representations of the highway, rail and interurban bus/coach networks. The model operates within the EMME/2 software.

3.2.2 The SoCoMMS model has been developed from a range of existing sources. The highway model has been developed from SERTM (South East Regional Traffic Model), ORBIT (a multi-modal study investigating orbital movements around London) and local models developed for other multi-modal studies (e.g. the Access to Hastings study and M27 Integrated Transport Study). The rail element of the model has been developed from data obtained from the DTLR (Department of Transport, Local Government and the Regions). The network databases have been developed in a Geographic Information System (GIS). The model covers an area from the south coast to London and the River Thames (northern boundary) and Wiltshire / Dorset (western boundary). The model operates for an average hour between 0700 and 1900.

3.3 ***The Wider Area Hastings Model***

3.3.1 The SATURN assignment model developed for the Access to Hastings study was made available to the SoCoMMS study team. The model was derived from highway models that had previously been developed to test schemes on the A21, A27 and A259. The SATURN model includes a simulation area within which, junctions are modelled in detail (in terms of saturation flows, and traffic signal timings). Along the coast, the simulation area extended from Lewes to Three Oaks. The network includes all A class and B class routes with a number of C class

routes. The model is validated against 1999 traffic data within the simulation area. The model operates for the morning peak period (0800-0900).

3.4 ***Travel Forecasts for 2016 Do-minimum- Network Assumptions***

3.4.1 In developing a strategy for the south coast, account has been taken of those transport initiatives that are currently under construction, currently committed and those measures likely to be in place by 2016. Within the study area, these include:

- **Trunk Roads Schemes**
- A27 - Polegate bypass- D2 standard
- **Major Rail Improvements**
- Completion of CTRL from Ashford to St Pancras – currently under construction (this will need to take into account changes to service patterns on the existing network)
- Virgin Cross- Country service improvements
- Completion of Thameslink 2000 and associated timetable changes
- **Franchise Proposals-**
- Measures arising from franchise proposals put forward by South Central, South West Trains and Connex South Eastern
- **Local Transport Plans-** Through the Local Transport Plan process, a number of initiatives have been accepted for funding in the December 2000 statement. These include:
- Crawley Fastway (guided bus scheme in the Gatwick Area)
- East Kent Access – A256 upgrade to dual carriageway
- South Hampshire Rapid Transit (including provision of light rail between Portsmouth and Fareham and bus improvements between Portsmouth and Waterlooville-Horndean Bus Improvements
- A280 Angmering Bypass
- **Other Schemes**
- East Kent Access Phase 2
- A259 Bognor Regis Relief Road.
- M20 junction 10a

3.4.2 In addition, there are a number of schemes in the Area of Influence being pursued which influence the South Coast corridor. These include:

- **Trunk Roads Schemes**
- M2 widening to D4 standard between Cobham and junction 4
- A2- Bean – Cobham Widening Phase 1 (Bean-Tolgate) -D4 standard

- A2 – Bean – Cobham Widening Phase 2 (Tolgate- Cobham) – D4 standard
- A21 - Lamberhurst bypass (S of Maidstone) – D2 standard
- A249 - Iwade – Queenborough Improvement (Kent) – D2 standard
- M25 - J12-J15 Widening (Surrey) –D5/D6 standard
- A2/A282 – Dartford Improvement (M25) – D4 standard
- A23 - Coulsdon Inner Relief Road (S London)- D2 standard
- **Schemes from Multi Modal Studies and Road Based Studies**
- A21 Tonbridge to Pembury Improvements
- A3 Hindhead Common Tunnel
- Service improvements Wadhurst to Tonbridge
- **Other Schemes**
- A24 Horsham – Capel Improvement

3.5 ***2016 Land Use Assumptions- Strategic Model***

3.5.1 Throughout the development of the SoCoMMS Reference Case we have, as far as possible, attempted to maintain consistency with the other multi-modal studies which are proceeding simultaneously. In so doing, we have used the latest TEMPRO projections as control totals at the County level for those counties in the study area which fall into the South East Region. These County totals were prepared by DTLR for use in the South East Regional Airport Services (SERAS) Reference Case and have been used to maintain consistency with SERAS, despite the reservations of some of the County Authorities about these totals.

3.5.2 However, the notable difference between the SoCoMMS methodology and that used for SERAS is the manner in which the district distributions for population, workforce, households and employment have been derived[1]. We felt that narrower study area of SoCoMMS necessitated more of a policy-related focus at the level of the individual districts, as it was thought that variations between Districts within the Counties are likely to have an impact on the study outcomes. Thus, in order to determine distributions across the Counties, reference has been made to the relevant County Structure Plans which set out housing allocations for each of the

[1] The SERAS Planning Reference Case derived district distributions by dividing the TEMPRO county trend-based totals by the TEMPRO county policy based totals to achieve a factor. This factor was then applied to each of the TEMPRO trend based totals at the district level so as to derive a policy based total for each of the districts.

districts. We have also consulted the County authorities to obtain their views on the distribution of these figures between the respective districts in their area.

3.5.3 Consultation with the Counties on the district distribution of the TEMPRO totals was undertaken in two phases. In the first instance letters were sent out following the land use planning workshop, requesting the population and employment figures which underpin the respective Structure Plan dwelling allocations to 2016 (where relevant). Housing and employment land monitoring reports were also requested.

3.5.4 In most cases, the levels of response from the Counties to this first round of consultation was good, although two broad issues emerged:

- In general, the Structure Plan time horizons were to 2011 rather than to 2016; and
- The County baseline figures and the projected growth figures were not always compatible with the TEMPRO County totals.

3.5.5 Although there was some level of variation between the levels of information supplied by the Counties, the approach adopted for each County was similar. For the assembly of the household, population and employment datasets, this broadly consisted of the following:

3.5.6 For **household growth**, based on the housing and employment land monitoring reports, an estimate of the completions to 1998 was obtained. This was fed into the baseline information and allowed us to calculate outstanding commitments (levels of housing growth) for the remainder of the Structure Plan period. Where the Structure Plan time horizon was to 2011, it was assumed that the distribution of dwelling growth implicit in the Structure Plan would continue to 2016 unless the County indicated otherwise. This permitted us to arrive at an estimate as to the distribution of future household growth between the districts in each county. This distribution was applied to the TEMPRO county level growth figure. When added to the TEMPRO 1998 base year figures, this yielded a distribution for 2016.

3.5.7 For **population growth**, where the county provided population growth figures, a similar approach to that described above was adopted, applying the County distribution to the TEMPRO County control total. Where the county did not provide population data, a similar distribution to that applied to household growth was applied to the TEMPRO population growth figure with the distribution for

2016 calculated as described above. For **workforce** totals a workforce/population factor was derived from the TEMPRO trend based forecasts for 2016 for each district, and then applied to the SoCCoMS population figures to arrive at a figure for 2016.

3.5.8 DTZ Pieda undertook to produce the **employment change** forecasts. TEMPRO 2016 county employment forecasts were used as control totals. A shift share method was adopted, taking into account land use policy considerations in order to determine the distribution of jobs at district level within each county. The first step was to calculate the shift in relative importance of employment within each district, assessing the distribution of the county total in the last 5 years, and to project that shift in the future to year 2016 assuming this shift happens at constant rate. These trend-based projections were then adjusted to take into account specific land use hypotheses that affect individual sites or areas within the districts. An adjustment factor was therefore applied to fine-tune the trend-based projections to knowledge of what is expected "on the ground" over the time period considered. Information on land use policy was substantiated by local forecasts of employment endorsed by the county councils themselves and / or by qualitative judgements from Structure Plans officers or forecasting officers in the County Councils.

3.5.9 Based on the above methodology, an interim draft distribution was derived for household, population and employment growth for each of the Counties to 2016. These figures were re-issued for comment by the Counties in mid-September. Where appropriate, the distributions have been adjusted to reflect further comments received. It is assumed that these figures are now generally in line with the County Authorities' views on the distribution of future growth for the purposes of this study.

3.5.10 Following consultation with the study area and area of influence local authorities, a set of planning data have been derived for each district. These are shown in Table 3.1.

	HOUSEHOLD		POPULATION		EMPLOYMENT		WORKFORCE	
District	**1998**	**2016**	**1998**	**2016**	**1998**	**2016**	**1998**	**2016**
Eastbourne	40,499	51,032	87,903	98,753	33,712	34,210	39,550	47,401
Hastings	35,521	42,931	79,454	90,915	33,460	34,312	35,168	42,730
Lewes	38,999	44,894	83,583	94,834	36,487	43,593	35,084	40,779
Rother	40,551	46,255	88,587	101,104	30,243	33,174	36,075	43,475
Wealden	61,293	70,711	138,937	152,831	54,230	58,336	66,286	76,416
EAST SUSSEX	**216,863**	**255,823**	**478,464**	**538,437**	**188,132**	**203,625**	**212,163**	**250,801**
Brighton & Hove	114,757	129,626	250,327	245,314	120,175	135,137	113,801	111,127

Table 3.1: Demographic Data- 2016 SoCoMMS Reference Case

3.5.11 There is an additional refinement in allocating growth levels to individual zones. The SoCoMMS team have undertaken a review of development plans and environmental constraints to assess the future distribution of development within a district. On this basis, growth in the SoCoMMS model is allocated away from environmentally sensitive areas.

3.5.12 Within the local area, a key consideration was in relation to developments as part of the Wealden Local Plan. The key developments include:

- 1000 Houses at Polegate;
- 1500 Houses at Hailsham; and
- 24,000 square metres Business Park development at Polegate.

3.6 ***Refinements for Land Use Assumptions—SATURN Model***

3.6.1 Within the SATURN model, growth has been allocated to zones within the model in one of three ways. For zones within the detailed model area (Lewes to Hastings) with no/limited development, a background traffic growth rate was applied. This was derived from analysis of TEMPRO information.

3.6.2 For zones with major developments in the detailed model area, whether brownfield or greenfield, the nature of the development site was established in terms of number of housing units, or floorspace by land use classification (e.g. A1, A8, B1). A series of trip rates were applied to represent additional trips to and from the zone in the morning peak. The rates were applied following examination of the rates used in the Access to Hastings study, and from examination of comparable developments in the TRICS database. In the case of brownfield developments, the distribution of trips was based on the pattern already being used

for that zone. For greenfield zones,in the absence of trip distribution functions, the trip distribution was taken from a neighbouring zone. This process was adopted for developments in Hastings, Rother and Wealden districts.

3.6.3 For external zones, growth was allocated on the basis of the TEMPRO growth rate to 2016.

3.6.4 A set of row and column growth factors were derived for each zone. The furness procedure was used to used to amend trip distributions to reflect these row and column totals.

3.6.5 Three sets of trip matrices were derived for use in testing measures in the A27 corridor. These include:

- A background growth matrix;, assuming no development sites in East Sussex;
- Background growth with brownfield sites; and
- Background growth with brownfield and greenfield development.

3.7 ***2016 Do-Minimum Forecasts***

3.7.1 The three development level trip matrices were assigned to a 2016 do-minimum network. Table 3.2 shows that the background growth in traffic flow is 9% at Beddingham. This is increased to 13% in terms of actual flows with greenfield development. However, the queues at the Southerham roundabout have increased. These queues are restricting the amount of traffic that can pass through this section. At Selmeston, the background growth is 19% and some 43% with greenfield development compared to 1999. At Wilmington, the background growth is 9% whilst the greenfield scenario growth is 26%.

		A27 Ebnd	A27 Wbnd	A27 Total	Diff vs Base
AM Base	1999	1085	1649	2734	-
Do Nothing	2016	1104	1886	2990	9.36%
Do Minimum – background growth	2016	1096	1871	2967	8.52%
Do-minimum- brownfield development	2016	1127	1892	3019	10.42%
Do-minimum- greenfield development	2016	1150	1946	3096	13.24%

Table 3.2a: Traffic flow at Beddingham- 2016 Do-minimum (based on SATURN Actual Flows)

		A27 Ebnd	A27 Wbnd	A27 Total	Diff vs Base
AM Base	1999	643	1003	1646	-
Do Nothing	2016	638	1326	1964	19.3%
Do Minimum – background growth	2016	638	1399	2037	23.8%
Do-minimum- brownfield development	2016	679	1440	2119	28.7%
Do-minimum- greenfield development	2016	846	1504	2350	42.8%

Table 3.2b: Traffic flow at Selmeston- 2016 Do-minimum (based on SATURN Actual Flows)

		A27 Ebnd	A27 Wbnd	A27 Total	Diff vs Base
AM Base	1999	737	812	1549	-
Do Nothing	2016	727	966	1693	9.30%
Do Minimum – background growth	2016	730	1080	1810	16.85%
Do-minimum- brownfield development	2016	755	1078	1833	18.33%
Do-minimum- greenfield development	2016	885	1073	1958	26.40%

Table 3.2c: Traffic flow at Wilmington- 2016 Do-minimum (based on SATURN Actual Flows)

3.7.2 Table 3.3 provides comparisons for two screenlines shown on figure 3.1. The table shows an increase across the East/West screenline due to the inclusion of the Polegate bypass.

Figure 3.1: Screenlines used for Analysis

1 A27 between Beddingham & Selmeston
2 A259 between Seaford & Newhaven
3 A26
4 A22
5 Polegate Bypass (PB)

		East/West Screenline			North/South Screenline		
		Nbnd	Sbnd	Total	Ebnd	Wbnd	Total
AM Base	2002	1583	1460	3043	1738	2561	4299
Do Nothing (% change from Base)	2016	1897 (+20%)	1575 (+8%)	3472 (+14%)	1865 (+7%)	3105 (+21%)	4970 (+16%)
Do Min-background (% change from Base)	2016	2827 (+79%)	2167 (+48%)	4994 (+64%)	1863 (+7%)	3164 (+24%)	5027 (+17%)
Brownfield (% change from base)	2016	2832 (+79%)	2250 (+54%)	5082 (+67%)	1923 (+11%)	3195 (+25%)	5118 (+19%)
Greenfield (% change from base)	2016	3211 (+103%)	2371 (+62%)	5582 (+83%)	1955 (+12%)	3118 (+22%)	5073 (+18%)

Table 3.3: Screenline Comparisons- do-minimum

3.7.3 The impact on journey times between Lewes and Polegate is shown in table 3.4. The table shows that in the eastbound direction in the morning peak there is little change in journey time between the base and the do-minimum with background growth. With the addition of greenfield development the journey time increases by 70 seconds compared to today. In the westbound direction, the journey time increases by 9 minutes with the background growth and over 11 minutes with development traffic.

	Year	A27 Eastbound	A27 Westbound
AM Base	1999	902	1097
Do Minimum – background growth	2016	901	1642
Do-minimum- brownfield development	2016	917	1672
Do-minimum- greenfield development	2016	972	1785

Table 3.4: Journey times (secs) between Lewes and Polegate

3.7.4 In summary, these do-minimum tests indicate increased pressure on the A27 east of Lewes, particularly in the Westbound direction. The forecast flows would indicate AADT levels at 2016 in the do-minimum scenario of:

- Beddingham 34,000
- Selmeston 28,200
- Wilmington 24,475

3.7.5 Each of these flows is in excess of the stress factor for that link.

3.8 ***Impact of Soft Measures***

3.8.1 An analysis was undertaken to assess the impact of traffic reduction strategies on flows and travel times along the A27 corridor. In order to test this, the 2016 trip matrices with developments were factored by 10 and 15%. These were considered to represent successful implementation of soft measures and modal competition. In addition a 20% reduction test was undertaken in liaison with MRTU, a consultant advising local people, to test the proposal in their technical submission (made as part of the consultation exercise) for a strong sustainability option. The 20% reduction combined soft policies with demand management with land use policies designed to slow growth and then stabilise traffic from development. The test has been carried out to all trips in the matrix and additional work could be undertaken to assess the impact of assuming differential rates for new and existing developments. A method was devised but it was not possible to test this in the time available.

3.8.2 Table 3.5 shows that with 15% traffic reduction eastbound travel times between Lewes and Polegate are the same as in the base. In the westbound direction, the travel time is 6 minutes slower than the base year. Thus, there is still a 31% increase in travel time, even with traffic reduction.

3.8.3 The maximum level of traffic reduction considered (20%), leads to a forecast reduction in eastbound travel times of 1.6%. In the westbound direction, the journey times are 23% higher than in the Base year.

Eastbound	Base	Do Min	10% traffic reduction	15% traffic reduction	20% traffic reduction
Time	902	972	919	906	888
(% change from base)		7.8%	1.9%	0.4%	-1.6%
Distance	17.31	17.31	17.31	17.31	17.31
Speed	69.1	64.1	67.8	68.8	70.2

Westbound	Base	Do Min	10% traffic reduction	15% traffic reduction	20% traffic reduction
Time	1097	1785	1516	1435	1347
(% change from base)		62.7%	38.2%	30.8%	22.8%
Distance	17.31	17.31	17.31	17.31	17.31
Speed	56.8	34.9	41.1	43.4	46.3

Table 3.5: Impact of Traffic Reduction Strategies on Journey Times

3.8.4 In the morning peak, roadside interview data shows that 60% of trips are home based work journeys, 24% goods vehicles, 3% employers business trips and 13% home based other journeys. To achieve a 15% reduction overall would require at least:

- A 20% reduction in home based work trips,
- A 15% reduction in home based other trips; and
- A 5% reduction in employers business trips.

3.8.5 In carrying out further assessments on these schemes, additional tests should be undertaken to assess the impact of the sustainability options.

4 Scheme Options for the A27 East of Lewes Corridor

4 Scheme Options for the A27 East of Lewes Corridor

4.1 ***Introduction***

4.1.1 This chapter outlines potential scheme options for improvements at Beddingham, Selmeston and Wilmington. This is based on a preliminary study. Following the multi modal study, if schemes are recommended, consideration of detailed designs may amend the alignments under consideration.

4.2 ***The Remitted Schemes- A27 Lewes to Polegate Improvement***

4.2.1 In November 1996, John Watts, who was Minister for Railways, Roads and Local Transport, announced that the original scheme to improve the A27 between Lewes and Polegate was to be replaced by three smaller scale improvements. This decision was made to reduce the adverse effects on the environment and the cost (a saving of £29 million on the original £82 million). The proposals were the Wilmington Bypass, Selmeston Bypass and Southerham to Beddingham Improvement.

4.3 ***A27 – Southerham to Beddingham Improvement- Overview***

4.3.1 The previously designed scheme consisted of approximately 2.4km of dual-two all-purpose carriageway between Southerham roundabout and Beddingham roundabout at an estimated cost of £19.4m[2]. The preferred route followed the line of the Lewes-Eastbourne Railway crossing underneath near the junction with the Lewes-Newhaven line. The roundabouts at Southerham and Beddingham were to remain at grade. However, this route did not go to public consultation.

4.3.2 The scheme's objectives were:

[2] Denotes figures quoted in the DETR press release "Roads Review-Consultation Document. *What Role for Trunk Roads in England?*" June 1998

- to provide additional road capacity to cater for present flows and future predicted traffic growth;
- to reduce delays to trunk road traffic by the Beddingham railway level crossing on the existing trunk road; and
- to improve safety.

4.3.3 The objective of reducing delays at Beddingham Level Crossing is particularly important due to the SoCoMMS proposals for increased train frequencies on the East Coastway route (from 4 to 7 trains per hour in each direction).

4.3.4 The alternatives for improvements between Southerham and Beddingham are:

- Off-line route using the Protected route, or
- On-line improvement on the existing route.

4.3.5 In addition, there is the choice between going under or over the railway line.

4.3.6 The section of the A27 between Southerham and Beddingham also carries traffic for the A26. There is little scope for changing the off-line character of the Protected Route (as per the 1996 announcement) for a bypass due to the proximity of both railway lines (Lewes-Eastbourne and Lewes-Newhaven) and the topography to the north. The off-line bypass would require significant earthworks to create the embankment needed to pass over the railway line. As this area is very flat, such works are likely to be visually intrusive and difficult to screen. An underpass beneath the railway could be considered but is within the floodplain of the river .

4.3.7 The alternative is an on-line improvement. In engineering terms, this may be more difficult particularly with the level-crossing for the Lewes-Eastbourne Railway and the substandard horizontal and vertical alignment of the existing route. The existing route also has a significant area of cutting at Ranscombe Hill which may be difficult to widen without significant environmental impact (particularly if the road is to be D2 standard). At the level crossing the route would need to go off-line in order to cross the railway.

4.3.8 On the basis of current traffic flows, the Beddingham Bridge will require widening to accommodate a WS2 or a D2 standard road. In considering the safety objective, a D2 standard road would normally have a lower accident rate than a WS2 standard road.

4.3.9 The traffic and environmental impacts of options are outlined in later sections.

4.4 ***Selmeston- Overview***

4.4.1 The scheme consisted of approximately 2.8km of dual-two all-purpose carriageway between Middle Farm and Alciston at an estimated cost of £10.6m*. The preferred route ran just south of the existing road along the majority of its length crossing the A27 north of Alciston. The route however, has not been the subject of public consultation.

4.4.2 The scheme's objectives were to provide additional road capacity to cater for future predicted traffic growth and to reduce severance of Selmeston and Alciston by removing through traffic.

4.4.3 **Alignments**- The horizontal and vertical alignment through Selmeston is below standard and together with the close proximity of several buildings to the road, on-line widening would be difficult. The Protected Route (as per the 1996 announcement) would appear to be the most suitable. A northern route would need to pass round the village and would be long in character. The southern route provides the shorter route. However, it may be possible to tie the bypass back into the existing route closer to the west of Selmeston rather than near Middle Farm (see attached plan). The section between the tie in point and Middle Farm would still require some improvement (particularly to the vertical alignment), any widening of this section could be achieved without impacting on any properties. There would be traffic management difficulties associated with on-line works.

4.4.4 The route could be built as WS2 or D2 depending on the traffic flows. The traffic and environmental impacts are outlined later.

4.5 ***Wilmington- Overview***

4.5.1 The previously identified scheme consisted of approximately 5.8km of dual-two all-purpose carriageway sections between the roundabout at Berwick and the western end of the Polegate bypass (currently under construction). The cost of the scheme is estimated at £31.6m (2001 prices).

4.5.2 From the Berwick roundabout eastwards, the bypass consisted of approximately 1km of online widening of the existing A27 including the Cuckmere river crossing. The route then headed in a north-easterly direction crossing the Lewes-Eastbourne Railway after which the direction changed towards the southeast. After following

the direction of the railway line for approximately 2km the route headed north east once more connecting into the A27 Polegate Bypass at the Cophall Roundabout.

4.5.3 The scheme's objectives were to provide additional road capacity to cater for future predicted traffic growth and to bypass Wilmington and the dogleg where the A27 joins the A22.

4.5.4 The existing A27 (Lewes Road) between the junction with the A22 (Polegate Bypass) and Berwick is a S2 standard carriageway. The relatively straight horizontal and vertical alignment of the road allows a good speed to be maintained by most vehicles and the possibility of overtaking.

4.6 ***Wilmington Alternatives-***

4.6.1 There are a number of potential alternatives for alignments at Wilmington. These include:

- On-line improvements;
- Off-line bypass (as per the protected route); and
- Alternative off-line bypass (that ties in with existing A27 and does not link to the Polegate bypass).

4.6.2 In addition, consideration has also been given to a link the A27 at Folkington and the new Polegate bypass. This could be considered in addition to the alternative off-line bypass of Wilmington outlined above.

4.6.3 ***On-line widening*** -The existing route could be widened to WS2 without too much intrusion into the adjacent land. Within Wilmington itself there would be issues with properties close to existing road. Private accesses and the junctions of minor roads would also require consideration. Some re-alignment may be necessary though at a number of locations, i.e. near the Milton Street junction and the Folkington Road junction.

4.6.4 Any on-line improvements (both vertically and horizontally) would require significant consideration of traffic management issues.

4.6.5 The existing section of the A22/A27 could be widened on-line. This would require a junction improvements at the existing traffic signal junction. This would require land take from the ESCC depot to facilitate junction improvements.

4.6.6 ***Off-line Bypass*** - It may be possible to consider alternatives to the route of the off-line bypass (as per Nov 1996 announcement) around Wilmington. The route could follow the existing line as far as the point where the railway line veers off to the northwest. The new route could continue to follow the alignment of the railway line, passing to the north of Newbarn Farm. The route would then swing south (passing to the south of the Sewage Works), then tie back into the existing A27 near the junction with Milton Street. Such an option would not provide a link to the Polegate bypass as with the protected route.

4.6.7 This would eliminate the need to cross the railway line thus reduce the need for visually intrusive embankments. The loss of woodland to the south of Wootton Manor Estate would also be prevented.

4.6.8 ***Wilmington Bypass and a Connection to New Polegate Bypass (Folkington Link***)- The protected route includes a bypass of Wilmington with an alignment north of the railway line and a link to the Polegate bypass. An alternative approach would be to build the Wilmington bypass (as in 4.6.6) such that it ties in with the existing A27 and then construct a separate link from the A27 (near the edge of the built up area of Polegate) to the new Polegate Bypass. A roundabout could be provided where the link would tie in with the A27 at the southern end. The size and location of the southern junction may be restricted due to the close proximity of the railway and properties, however, if the proposed link was only WS2 standard a large roundabout may not be required.

4.6.9 The link would cross the Lewes-Eastbourne Railway on approach to the roundabout. This could be achieved relatively easily as the railway is in a significantly deep cutting at that location. The impact on Polegate Honey Farm would have to be considered when determining the exact route of the link.

5 Traffic Assessment

5 Traffic Assessments

5.1 ***Introduction***

5.1.1 The morning peak SATURN model has been used to test a range of options along the A27 corridor. The tests were undertaken against the 2016 network using the three demand levels outlined in chapter 3. The following networks were tested:

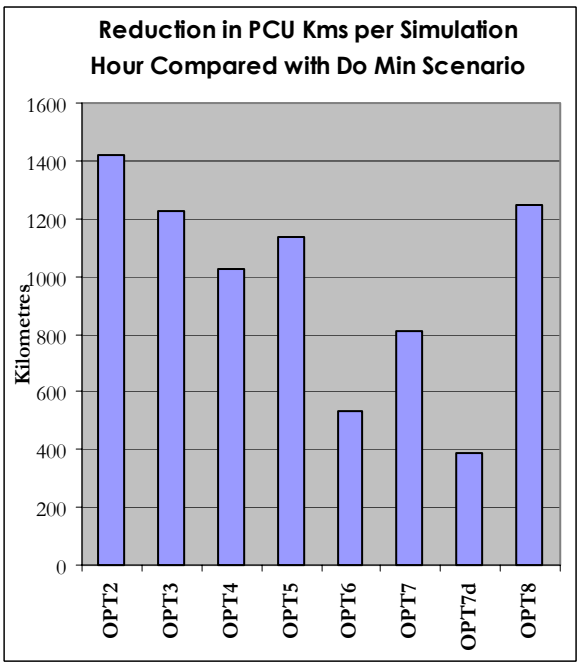
- Do-minimum
- Option 2- Beddingham improvement (on-line and off-line was found to have little impact on flows- assumed Dual carriageway 2- lane);
- Option 3- Selmeston bypass WS2 with Beddingham improved to D2
- Option 4- Selmeston bypass- D2 with Beddingham improved to D2
- Option 5- Wilmington bypass WS2 with Option 3
- Option 6- Wilmington bypass D2 with Option 4
- Option 7- Folkington link WS2 with Wilmington Bypass
- Option 7d Folkington link D2 with Wilmington Bypass
- Option 8 On-line improvements A22/A27.

5.1.2 This chapter outlines the results of these tests.

5.2 ***Network Statistics***

5.2.1 Figure 5.1 represents the reductions in network statistics. These results are based on the tests using the Greenfield development scenario (maximum development). In each of the options that were tested there are reductions in network travel times and distance travelled.

5.2.2 The largest reduction in vehicle kilometres is the Beddingham improvement alone (Option 2). As greater capacity is added to the A27, the reduction in vehicle kilometres is less. This is due to traffic diverting from other routes as will be outlined later. The largest reduction in network travel times is option 7D (Folkington Link).



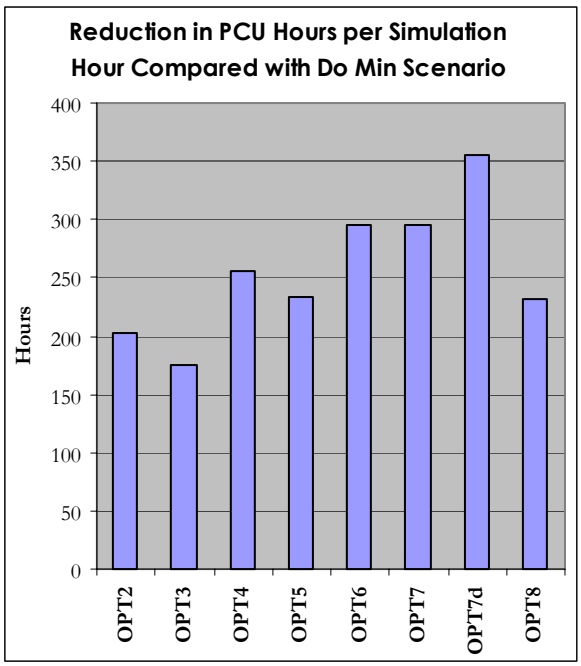


Figure 5.1: Changes in Network Statistics

5.3 ***Traffic Flow Changes***

5.3.1 Table 5.1 shows traffic flow changes on the north-south screenline. This shows that, compared with the 2016 do-minimum situation:

- The road improvement schemes have little impact on A27 flows, although the dual carriageway Wilmington schemes give rise to a slightly increased flow (5%);
- There is no significant impact on the A259 flows;
- The improvement at Beddingham gives rise to a 25% decrease (50 vehicles) on the B2124 at Ringmer; and
- It is noted that these scheme tests have incorporated limited improvements in capacity at Lewes roundabouts.

5.3.2 Table 5.2 compares the flows on the east-west screenline. It shows that there are significant increases in traffic flow on the A26 as a result of the Beddingham improvement, compared with flows in the 2016 do-minimum situation.

Table 5.1: Comparison of Flows Across North-South Screenline

		North/South Screenline											
		A27 Ebnd	A27 Wbnd	A27 Total	**Diff vs Do Min**	A259 Ebnd	A259 Wbnd	A259 Total	**Diff vs Do Min**	B2124 Ebnd	B2124 Wbnd	B2124 Total	**Diff vs Do Min**
AM Base	2002	643	1003	1646	**-**	904	1151	2055	**-**	191	407	598	**-**
Do Min	2016	846	1504	2350	**-**	1055	1327	2382	**-**	54	287	341	**-**
Bedd (D)	2016	864	1465	2329	**-0.9%**	1087	1386	2473	**3.8%**	53	203	256	**-24.9%**
Selm (S)	2016	851	1451	2302	**-2.0%**	1089	1389	2478	**4.0%**	60	293	353	**3.5%**
Selm (D)	2016	880	1501	2381	**1.3%**	1080	1381	2461	**3.3%**	54	269	323	**-5.3%**
Wilm (S)	2016	897	1460	2357	**0.3%**	1093	1393	2486	**4.4%**	59	278	337	**-1.2%**
Wilm (D)	2016	971	1513	2484	**5.7%**	1085	1384	2469	**3.7%**	54	258	312	**-8.5%**
Wilm2 (S)	2016	878	1454	2332	**-0.8%**	1091	1391	2482	**4.2%**	60	268	328	**-3.8%**
Wilm2 (D)	2016	959	1508	2467	**5.0%**	1083	1304	2387	**0.2%**	54	258	312	**-8.5%**
Wilm (onD)	2016	876	1501	2377	**1.1%**	1079	1378	2457	**3.1%**	54	267	321	**-5.9%**

Table 5.2: Comparison of Flows Across East-West Screenline

		East/West Screenline											
		A26 Nbnd	A26 Sbnd	A26 Total	**Diff vs Do Min**	A22 Nbnd	A22 Sbnd	A22 Total	**Diff vs Do Min**	PB Nbnd	PB Sbnd	PB Total	**Diff vs Do Min**
AM Base	2002	551	446	997	**-**	1032	1014	2046	**-**	-		-	**-**
Do Min	2016	559	452	1011	**-**	1498	1114	2612	**-**	1154	805	1959	**-**
Bedd (D)	2016	812	646	1458	**44.2%**	1510	1119	2629	**0.7%**	1149	810	1959	**0.0%**
Selm (S)	2016	814	685	1499	**48.3%**	1507	1118	2625	**0.5%**	1150	804	1954	**-0.3%**
Selm (D)	2016	815	651	1466	**45.0%**	1510	1116	2626	**0.5%**	1140	808	1948	**-0.6%**
Wilm (S)	2016	809	642	1451	**43.5%**	1533	1166	2699	**3.3%**	1132	812	1944	**-0.8%**
Wilm (D)	2016	820	654	1474	**45.8%**	1534	1158	2692	**3.1%**	1184	709	1893	**-3.4%**
Wilm2 (S)	2016	816	644	1460	**44.4%**	1576	1175	2751	**5.3%**	1101	811	1912	**-2.4%**
Wilm2 (D)	2016	816	652	1468	**45.2%**	1569	1161	2730	**4.5%**	1101	805	1906	**-2.7%**
Wilm (onD)	2016	817	652	1469	**45.3%**	1508	1122	2630	**0.7%**	1151	810	1961	**0.1%**

PB=Polegate Bypass

5.3.3 Table 5.3 compares the total flows across the two screenlines for each of the schemes tested and for 2016 do-minimum . This shows that flows across the east-west screenline increase by 8-9%, depending on the scheme. Traffic flows across the north-south screenline increase by up to 4% (Wilmington Bypass, D2).

Table 5.3: Overall Comparison of Flows on the Two Screenlines

		East/West Screenline				North/South Screenline			
		Nbnd	Sbnd	Total	% Diff vs Do Min	Ebnd	Wbnd	Total	% Diff vs Do Min
AM Base	2002	1583	1460	3043	-	1738	2561	4299	-
Do Min	2016	3211	2371	5582	-	1955	3118	5073	-
Bedd (D)	2016	3471	2575	6046	8.3%	2004	3054	5058	-0.3%
Selm (S)	2016	3471	2607	6078	8.9%	2000	3133	5133	1.2%
Selm (D)	2016	3465	2575	6040	8.2%	2014	3151	5165	1.8%
Wilm (S)	2016	3474	2620	6094	9.2%	2049	3131	5180	2.1%
Wilm (D)	2016	3538	2521	6059	8.5%	2110	3155	5265	3.8%
Wilm2 (S)	2016	3493	2630	6123	9.7%	2029	3113	5142	1.4%
Wilm2 (D)	2016	3486	2618	6104	9.4%	2096	3070	5166	1.8%
Wilm (onD)	2016	3476	2584	6060	8.6%	2009	3146	5155	1.6%

5.4 ***Travel Times on A27***

5.4.1 Travel time information has been collated for journeys along the A27 between Lewes and Polegate. The comparison is shown in Figure 5.2. The travel time variability for each of the schemes is less in the eastbound direction than in the westbound direction. This reflects the lack of congestion in the morning peak in the eastbound direction. It should be noted that eastbound congestion in the PM peak, and therefore eastbound journey times, would be significantly higher.

Eastbound

5.4.2 In the eastbound direction the Beddingham improvement reduces travel times by 70 seconds. The Selmeston scheme reduces travel times by 60 and 100 seconds, for the WS2 and dual carriageway options, respectively. The Wilmington bypass D2 version of the preferred route reduced eastbound travel times by 200 seconds.

Westbound

5.4.3 The main travel time impacts are in the westbound direction in the morning peak. the Beddingham improvement reduced travel times by 330 seconds. Similarly, the Selmeston schemes reduce travel times between 320 and 360 seconds.

5.4.4 As in the eastbound direction, the Wilmington dual carriageway option provides the most significant decrease in journey time (630 seconds), compared with the do-minimum.

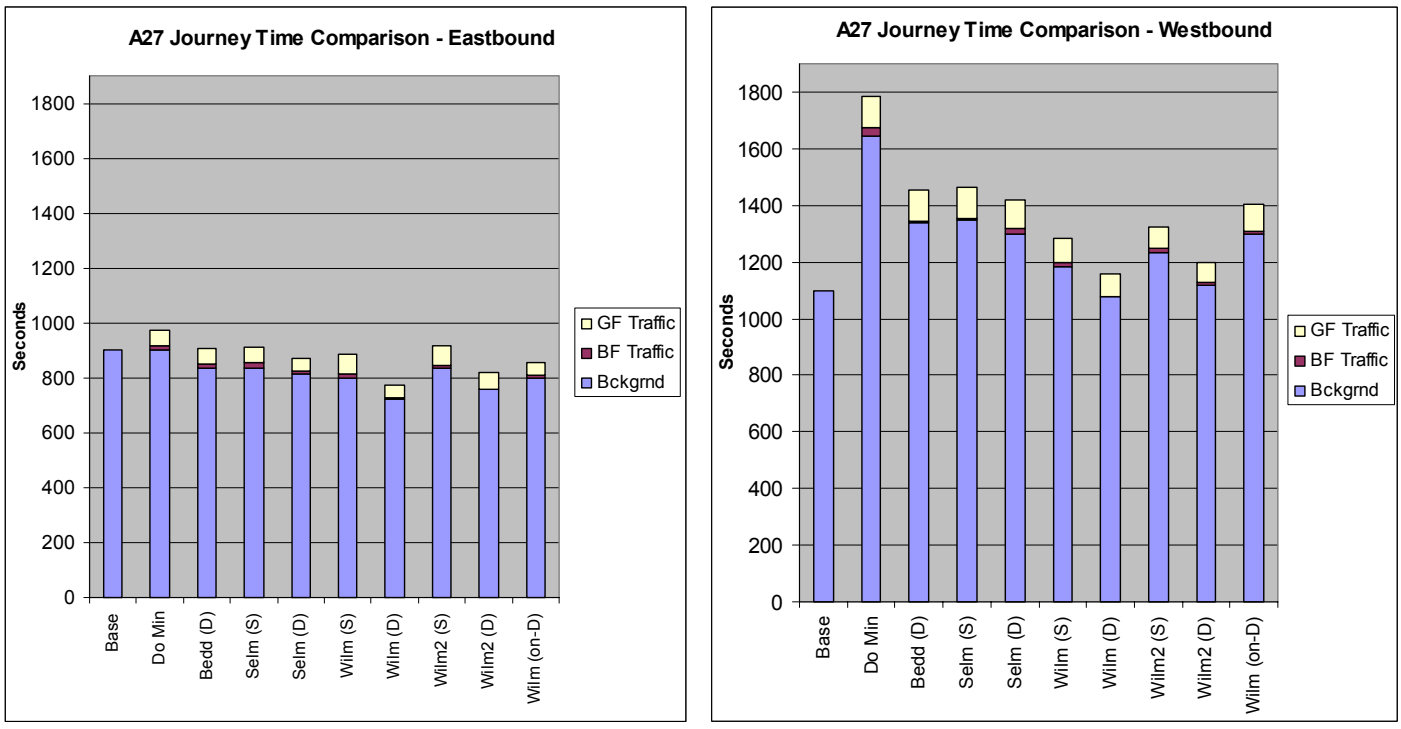


Figure 5.2: Journey Time Comparison- A27 Lewes - Polegate

5.4.5 Figure 5.3 compares travel times for the base, do-minimum, complete dualling (of Beddingham, Selmeston & Wilmington options) and the traffic reduction tests reported in chapter 3. This shows that in the westbound direction, the provision of the dual carriageway bypass produces a travel time similar to today, indicating that the provision of capacity matches today's network conditions. The travel reduction tests still provide slower travel times than today.

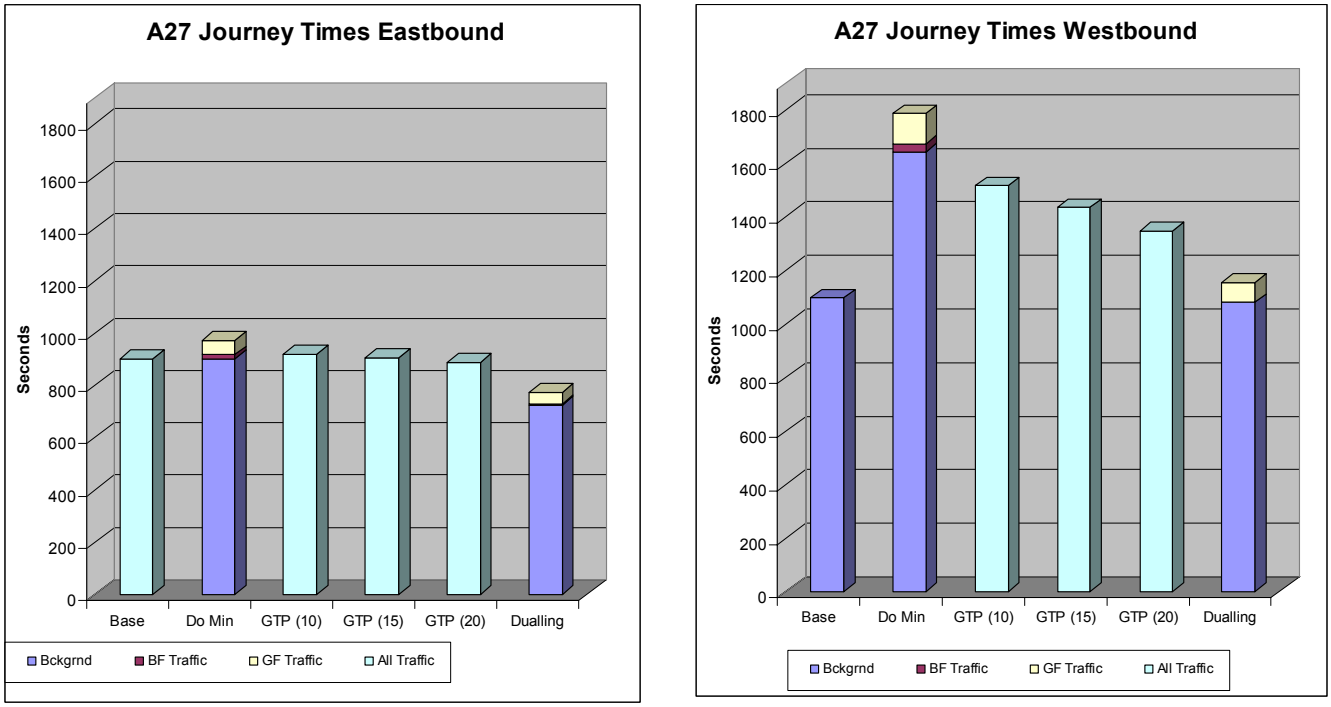


Figure 5.3 Comparison of Dualling Test against Traffic Reduction tests

Note: GTP runs are assigned against greenfield matrix factored down by 10%, 15% and 20%. Dualling scenario comprises dualling between Lewes & Beddingham, dual bypass of Selmeston and dual bypass of Wilmington.

5.4.6 Figure 5.4 compares the travel speeds obtained with the traffic reduction tests and those with the A27 (dualled or unchanged).

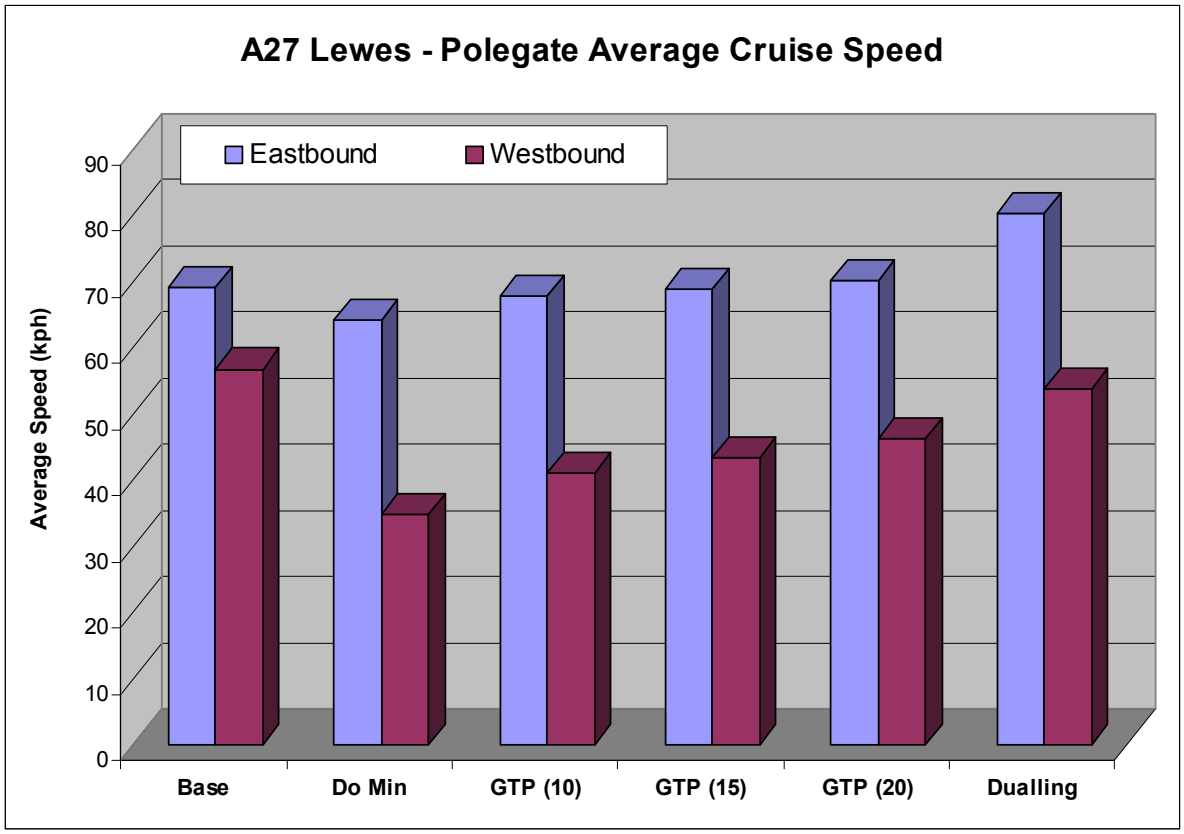


Figure 5.4: A27 Cruise Speeds

5.5 ***AADT Traffic Levels***

5.5.1 The results of the SATURN assignments have been used to assess the future year AADT traffic levels on the corridor. In order to develop these estimates, use has been made of both the actual and demand flow estimates produced by SATURN. The former reflect traffic levels on links, while the latter reflect the demand that would like to pass through a section, but are queued at various locations through the network Tables 5.5 and 5.6 show the flows that have been derived.

Scenario	Beddingham	Selmeston	Wilmington
2016 Do-minimum Background	32000	24700	2300
2016 Do-minimum brownfield	32800	25700	23700
2016 Do-minimum Greenfield	33600	28600	25300
Beddingham D2	38900	26200	23600
Selmeston WS2	39800	25600	25400
Selmeston D2	40000	28900	25500
Wilmington WS2	40400	28200	19300
Wilmington D2	39600	29200	25000

Table 5.5 2016 AADT Estimates based on growth in Actual Flows

Scenario	Beddingham	Selmeston	Wilmington
2016 Do-minimum Background	34700	25700	24400
2016 Do-minimum brownfield	34000	26600	24400
2016 Do-minimum Greenfield	37100	31500	28700
Beddingham D2	45200	31000	28600
Beddingham D2 & Selmeston WS2	45000	30200	28600
Beddingham D2 & Selmeston D2	45300	31600	28700
Beddingham D2 & Wilmington WS2	45600	30700	20010
Beddingham D2 & Wilmington D2	46100	32900	25800

Table 5.6 2016 AADT Estimates based on growth in Demand Flows

5.5.2 These flows indicate the standard that could be required if improvements are put forward:

- Beddingham – 2 lane dual carriageway;
- Selmeston – could be 2 lane dual carriageway or wide single carriageway
- Wilmington – Wide single carriageway

5.5.3 A further issue is in consideration of the link to the Cophall Roundabout. Given the traffic volumes on the A27 and A22 consideration should be given to the potential for grade separation of this junction. This should be investigated by the Highways Agency in further work following SoCoMMS.

5.6 ***Summary of the Traffic Options Testing***

5.6.1 The summary of the findings of these tests are:

- Improvements at Beddingham provide the greatest impact on delays;
- There are traffic reductions on the B2124;
- Providing dual carriageway improvements produces forecast traffic speeds in 2016 comparable to today; and
- There is little difference in flows between single carriageway and dual carriageway options.

5.6.2 The key impacts of the Soft Options are:

- Reduction in traffic on the network;
- Slight reduction in journey times compared to Do- Minimum;
- Westbound times are however still 23-40% longer than Base year times;
- Increase in average speed on A27 (both directions) compared to the do-minimum, but still significantly slower than for the Base year; and
- Overall impact is not as significant as dualling – in the AM peak this would essentially hold times and speeds at base levels in the westbound direction and improve them in the eastbound direction.

6 Environmental Appraisal

6 Environmental Appraisal

6.1 ***Impact on the Physical Environment - Introduction***

6.1.1 The assessment methodology has followed the assessment approach as set out in GOMMMS. The full GOMMMS assessment worksheets have been completed for each scheme.

6.1.2 Additionally, a worksheet was devised in order to summarise the GOMMMS worksheets. These reflect the GOMMMS assessment stages and aggregated scoring. The worksheets are based on these four stages, or steps, which are explained below, with the results and scores being translated onto the Appraisal Summary Table. Summary sheets were completed for each option.

6.2 ***Landscape***

6.2.1 Landscapes as defined by GOMMMS encompassess both the physical and cultural characteristics of the land itself and the way in which we perceive these characteristics. The methodology is based on an assessment of impacts on specific locations along the corridor where schemes are to be implemented.

Methodology

6.2.2 **Step A** – Description of the Countryside Character

(1) Description of the character zones where there is to be landtake (broad character area descriptions/tranquil areas);
(2) Identify main features that give the zone its district character/local distinctiveness/key characteristics; and
(3) Identify any landscape designations.

6.2.3 The methodology involves the describing of the countryside characteristics of the location. These characteristics or features come under the headings of:

- **pattern** –an expression of the relationship between topography and form, elevation and the degree of enclosure and scale
- **tranquillity** – the remoteness and sense of isolation, or lack of it within the landscape

- **cultural** – descriptions of how landscape elements of an historic or traditional nature contribute to landscape character
- **landcover** –the way in which the land is farmed or managed contributes to the character of the landscape
- **summary of character**- summarises and pulls together the primary features outlined above and includes more general observations

6.2.4 **Step B** - Evaluating Environmental Capital and Sensitivity to Change

(1) Identify the key attributes and their importance (eg scale, rarity, importance and substitutability);
(2) Identify the landscape's sensitivity to change:
  - low sensitivity;
  - moderate sensitivity; and
  - high sensitivity.

6.2.5 GOMMMS provides landscape indicator against which the description of each feature is assessed. These indicators are:

- **geographical scale** at which the feature attribute matters
- **rarity** of the feature in the locality and at regional and national level
- **importance** of feature and at what level
- **substitutability** addresses whether features are replaceable within a nominal 100 years
- **impact** – used to describe and score the potential impact of the scheme on features and attributes
- **additional mitigation** as part of the scheme design to achieve best fit within the landscape

6.2.6 GOMMMS suggests the completion of worksheet 4.5 so to assess the affect of the schemes on the features. The worksheets for each scheme are set out in Appendix B.

6.2.7 **Step C** - Impact Assessment

(1) Identify the potential impacts of the 'plan stage';

- direct and indirect landscape impacts and effects; and
- positive or adverse effects.

(2) Complete the Landscape 'Worksheet' (GOMMMS) and confirm Summary Assessment Score, together with qualitative comments. Use GOMMMS Scoring:
   (a) Very large negative impact;
   (b) Large negative impact;
   (c) Moderate negative impact;
   (d) Slight negative impact;
   (e) Neutral impact;
   (f) Slight positive impact; and
   (g) Moderate positive impact.

(3) Complete the Landscape section in the Appraisal Summary Table:
- Qualitative Impact;
- Quantitative Impact; and
- Assessment Score.

6.2.8 Meetings and discussions with statutory environmental bodies, county and local authorities, and the public have taken place and have informed the baseline environmental data.

6.2.9 The overall impact that each of the schemes has on the landscape is given an assessment score. These scores are based on the standard 7 point scale outlined and defined in GOMMMS. The following impact scores are given to the locations within the study area where the strategy suggests schemes should be introduced.

6.2.10 All of the accumulated data has been recorded in a set of plans on the SoCoMMS GIS Environmental Database to provide the basis for the assessments. These include landscape, biodiversity, cultural heritage, and townscape designations.

Appraisal

6.2.11 Direct results of the appraisal for each element assumed in the strategy are shown below:

LANDSCAPE		
Scheme	**Impact**	**Score**
Southerham-Beddingham	The flyover is likely to have a particularly adverse visual impact on the open landscape of the South Downs AONB and on the setting of Beddingham even taking account of the route staying online or broadly within the existing road corridor.	**Large Negative ***
Selmeston Bypass-single carriageway	Assuming a single carriageway bypass, the scheme will have a detrimental impact on the landscape particularly as viewed from the chalk downs to the south (South Downs AONB).	Moderate Negative
Selmeston Bypass-dual carriageway	Assuming a dual carriageway bypass, the scheme will have a significant detrimental impact on the landscape particularly as viewed from the chalk downs to the south (South Downs AONB).	**Large negative**
Wilmington Bypass	The scheme is likely to have a detrimental impact on landscape pattern and landscape particularly, albeit some sections are online or in close proximity to existing road/rail routes.	Moderate Negative
Wilmington on-line	The scheme, although it is online, is likely to have some detrimental impact on landscape pattern and landcover.	Slight Negative
Folkington link	The scheme is likely to have some detrimental impact on landscape pattern and landcover.	Slight Negative

*May be possible to mitigate through design.

6.3 ***Townscape***

6.3.1 Townscape is defined by GOMMMS as the physical and social characteristics of the built and unbuilt urban environment and the way in which we perceive those characteristics. The methodology is based on an assessment of impacts on specific locations along the corridor where schemes are to be implemented.

6.3.2 **Step A** - Townscape Characterisation

(1) Description of the townscape where there is to be landtake (relevant elements of Character Areas);

(2) Identify main features that give the area its townscape character; and

(3) Identify any townscape designations separately e.g. Area of Special Character - local plan designation (by scheme).

6.3.3 The methodology involves the describing of the townscape characteristics of the location. These characteristics or features come under the headings of:

- **Layout** – the way that buildings routes and open spaces are place in relation to each other
- **Density and mix** – refers to the amount of floorspace of buildings relative to and area and the range of uses
- **Scale** - is the size of buildings and structure in the townscape in relation to their surroundings
- **Appearance** – and local distinctiveness of buildings and structures within a townscape
- **Human Interaction** – the way in which people – rather than vehicles interact with the urban environment
- **Cultural** – descriptions of how townscape elements of a traditional or historic nature contribute to townscape character
- **Summary of character** - summarises and pulls together the primary features outlined above and includes more general observations

6.3.4 **Step B** - Evaluating Environmental Capital and Sensitivity to Change

(1) Identify the key attributes and their importance (e.g. scale, importance, substitutability).

6.3.5 GOMMMS provides landscape indicator against which the description of each feature is assessed. These indicators are:

- **geographical scale** at which the feature attribute matters
- **rarity** of the feature in the locality and at regional and national level
- **importance** of feature and at what level and to whom
- **substitutability** addresses whether features are replaceable
- **changes in do-minimum –** key changes that will occur in the absence of the transport proposal

- **impact** – used to describe and score the potential impact of the scheme on features and attributes
- **additional mitigation** as part of the scheme design to achieve best fit within the landscape

6.3.6 **Step C** - Impact Assessment

(1) Identify the potential input:
(2) Complete the Townscape 'Worksheet' (GOMMMS) and complete Summary Assessment Score, together with qualitative comments. Use GOMMMS Scoring:
  (a) Large negative impact
  (b) Moderate negative impact
  (c) Slight negative impact
  (d) Neutral impact
  (e) Slight positive impact
  (f) Moderate positive impact
  (g) Large positive impact
(3) Complete the Townscape Section of the Appraisal Summary Table:
  – Qualitative Impact;
  – Assessment Score

6.3.7 GOMMMS suggests the completion of worksheet 4.7 so to assess the affect of the schemes on the features. The worksheets for each scheme are set out in Appendix.

6.3.8 The overall impact that each of the schemes has on the townscape is given an assessment score. These scores are based on the standard 7 point scale outlined and defined in GOMMMS. The following impact scores are given to the locations within the study area where the strategy suggests schemes should be introduced.

6.3.9 Direct results of the appraisal for each element assumed in the strategy are shown below:

TOWNSCAPE		
Scheme	**Impact**	**Score**
Southerham-Beddingham	There are scattered buildings in the area, together with the village of Beddingham, which will have their townscape adversely affected.	Moderate Negative
Selmeston Bypass-WS2	The scheme will have benefits for the settlements within the area, such as Selmeston and some scattered farms.	Moderate Positive
Selmeston Bypass-D2	The scheme will have benefits for the settlements within the area, such as Selmeston and some scattered farms	Moderate Positive
Wilmington Bypass	There will be benefits to the townscape of Wilmington Green and east Polegate, as these areas will be bypassed, thus relieving congestion on local roads.	Slight Positive
Folkington Link	Benefits to the townscape of east Polegate, as these areas will be bypassed, thus relieving congestion on local roads.	Moderate Positive
Wilmington on-line	The online improvement would adversely impact on the townscape of the northern part of Wilmington.	Moderate Negative

6.4 ***Heritage***

6.4.1 The man-made historic environment as defined by GOMMMs comprises of: buildings of architectural or historic significance; areas such as parks gardens other designed landscapes or public spaces remnant historic landscapes and archaeological complexes; and sites (e.g. ancient monuments, places with historical associations such as battlefields, preserved evidence of human effects on the landscape etc).

6.4.2 **Step A** - Heritage Characterisation

(1) Description of the historic areas where there is to be landtake (relevant elements of Character Areas and Natural Areas);

(2) Identify main features that give the area its distinctive historic character; and

(3) Identify any heritage designations separately (by scheme/combination of schemes).

6.4.3 It involves describing the character of the heritage in question. The features that most strongly define the heritage resource come under the headings of:

- **Form** – the physical form of the site, buildings, historic land/townscapes or other heritage assets being described and appraised
- **Survival** – a description of the extent of survival of the likely original or characteristic fabric along with an estimate of how much remains
- **Condition** – the appearance and present management of the heritage resource along with its stability and likely rate of change from existing condition.
- **Complexity** – the diversity of elements and their relationships within a part of the heritage resource and the wider complexity of its relationships beyond these immediate limits.
- **Context** – the immediate setting of the site, building or area
- **Period** – the date of origin and duration of use of the heritage resource described

6.4.4 **Step B** - Evaluating Environmental Capital and Sensitivity to Change

(1) Identify the key attributes and their importance (eg scale, significance, rarity).

6.4.5 GOMMMS provides landscape indicator against which the description of each feature is assessed. These indicators are:

- **Scale it matters** – the geographical scale at which the features matter to both policy makers at all levels and to local stakeholders.
- **Rarity** - of the feature in the locality and at regional and national level as well as the fragility and vulnerability of the heritage
- **Significance** – of the feature at the local, regional and national scale
- **Impact** - used to describe and score the potential impact of the scheme on features and attributes

6.4.6 GOMMMS suggests the completion of worksheet 4.8 so to assess the affect of the schemes on the features. The worksheets for each scheme are set out in Appendix.

6.4.7 The overall impact that each of the schemes has on the townscape is given an assessment score. These scores are based on the standard 7 point scale outlined

and defined in GOMMMS. The following impact scores are given to the locations within the study area where the strategy suggests schemes should be introduced.

6.4.8 **Step C** - Impact Assessment

(1) Identify the potential impacts

(2) Complete the Heritage 'Worksheet' (GOMMMS) and complete Summary Assessment Score, together with qualitative comments. Use GOMMMS Scoring:

(a) Large negative impact;
(b) Moderate negative impact;
(c) Slight negative impact;
(d) Neutral impact;
(e) Slight positive impact;
(f) Moderate positive impact; and
(g) Large positive impact

(3) Complete the Heritage of Historic Resources Section of the Appraisal Summary Table:

- Qualitative Impact
- Quantitative Impact; and
- Assessment Score.

Appraisal

6.4.9 Direct results of the appraisal for each element assumed in the strategy are shown below:

HERITAGE		
Scheme	**Impact**	**Score**
Southerham-Beddingham	The proposed scheme will probably affect at least three SAMs. The scheme will also probably affect a range of archaeological/palaeo-environmental remains sealed in or below the alluvial deposits of the valley floor.	Moderate Negative
Selmeston Bypass	The scheme will directly impact upon and sever the historic landscape of the study area as well as affecting the setting of Firfe Park and may also affect the setting of Charlston Museum. The scheme may potentially impact upon currently unidentified assets from a range of periods.	Moderate Negative
Wilmington Bypass	The scheme will directly impact on and sever the historic landscape of the study area. The scheme may impact on the setting and amenity value of Wilmington, Wooton Manor and Berwick. The scheme may also have an impact on the amenity value of Wilmington Green. The scheme may also impact upon a number of currently unidentified assets.	Moderate Negative
Folkington Link	The scheme will directly impact on and sever the historic landscape of the study area. The scheme may have a slight impact on the setting and amenity value of Wootton Manor. The scheme may also impact upon a number of currently unidentified assets.	Slight Negative
Wilmington –online	The scheme will adversely impact on the historic settlement of Wilmington. The scheme may also adversely affect the setting and character of a number of architectural assets in Wilmington. The scheme may impact upon the setting and amenity value of Wootton Manor and Berwick. The scheme may also impact upon a number of currently unidentified assets.	Moderate Negative

6.5 ***Biodiversity***

6.5.1 The methodology is based on an assessment of impacts on all biodiversity and earth heritage areas in the study areas along the corridor where schemes are to be implemented.

6.5.2 **Step A** - Description of Biodiversity and Earth Heritage Features

(1) Identify the main biodiversity and earth heritage features that give the area its distinctive character; and
(2) Identify the designated area (international, national and county) (define by scheme/ combination of schemes)

6.5.3 It involves describing the biodiversity and earth heritage features of the location under the following headings:

- Area - all biodiversity and earth features that are affected, or potentially affected by each scheme are listed.
- Attribute/feature
- Scale at which it matter
- Importance
- Trend
- Substitution possibilities

6.5.4 **Step B** - Evaluating Environmental Capital and Sensitivity to Change

(1) Identify for the main features their key attributes;
(2) Identify sensitivity to change of attributes/features:

6.5.5 **Step C** - Impact Assessment

(1) Identify the potential impacts;
(2) Complete the biodiversity "Worksheet" (GOMMMS) and complete Summary Assessment Score, together with qualitative comments. Use GOMMMS Scoring:
    (a) Very Serious Adverse Impact;
    (b) Serious Adverse Impact;
    (c) Significant Adverse Impact;
    (d) Minor Adverse Impact;
    (e) Neutral;
    (f) Minor Gain;
    (g) Significant Gain; and
    (h) Major Gain.
(3) Complete the Biodiversity section of the Appraisal Summary Table:

- Qualitative Impact;
- Quantitative Impact and
- Assessment Score.

Appraisal

6.5.6 Direct results of the appraisal for each element assumed in the strategy are shown below:

BIODIVERSITY -		
Scheme	**Impact**	**Score**
Southerham-Beddingham	The construction of the roundabout and possible landtake could have a minor adverse impact on Lewes Brooks SSSI and Beddingham Grazing Marsh and Lewes Railway Land SNCIs.	Minor Adverse
Selmeston Bypass	The Firle Escarpment SSSI and Tilton Wood SNCI are far enough from the proposed road as not to be affected.	Neutral
Wilmington Bypass	The two SSSIs (Milton Gate Marsh and Arlington Reservoir) and the Monkyn Pyn SNCI all support a breeding bird community.	Minor Adverse
Folkington Link	The two SSSIs (Milton Gate Marsh and Arlington Reservoir) and the Monkyn Pyn SNCI are sufficiently far away from the proposals to be affected.	Neutral
Wilmington -online	The two SSSIs (Milton Gate Marsh and Arlington Reservoir) and the Monkyn Pyn SNCI all support a breeding bird community.	Minor adverse

6.6 ***Water***

6.6.1 At the strategic level of assessment, either the GOMMMS methodology or MMEA (Multi Modal Environmental Assessment) methodology could be used. The MMEA methodology has been used on the recently completed South West Area Multi Modal Study (SWARMMS) appraisal. The selection of the same methodology was based on the following reasons:

- GOMMMS is unclear on how the potential impacts arising from proposals should be identified. MMEA uses a simple ranking system for various transport modes and their potential to adversely impact the water environment*;*

- GOMMMS does not provide any real guidance/method for assessment at the strategic level, leaving much for the user to decide. MMEA leads the user through the methodology;
- GOMMMS requires a fair degree of information taking the outputs of the environmental impact assessment process, and is geared more to assessment at project/scheme level, whereas MMEA is designed for strategic assessment and requires much less data;

6.6.2 The MMEA methodology requires the use of a combined scoring/weighting system to provide quantitative evaluation of different strategy or scheme impacts. This scoring system was first used on the SWARMMS appraisal and provides rapid quantitative "illustration" of particular impacts associated with different scheme elements in any derived strategy. The methodology applied is outlined in the Strategy Appraisal Report.

Data Sources

6.6.3 For studies carried out on a strategic regional level the MMEA methodology identifies appropriate data sets for groundwaters and surface waters. These are as follows:

Indicator	Source
Groundwater - Groundwater Vulnerability Zones	Groundwater vulnerability maps published by HMSO at 1:100,000 scale (available as hard copy and digitally)
Rivers **-** Chemical GQA's - Biological GQA's - River Ecosystem Class	-From EA web site and regional maps (requested from the EA where required). -Regional maps (requested from the EA where required) -Designations for a given river from regional offices of the EA
Floodplains	Further details (local assessment only) from Section 105 maps from Flood Defence sections of regional office of EA

6.6.4 Of the above data sources, Groundwater Vulnerability Zone data is readily available nationally and Chemical GQA's are readily available from the EA web site. Biological GQA's and River Ecosystem classes are not so readily available and have not been used in the assessment. However, River Chemical GQA gives a good indication for river quality that may be used in a strategic assessment. Floodplain information has been derived from the indicative flood plain maps, also from the EA web site.

6.6.5 More detailed levels of data collection are not relevant or appropriate for strategic studies, however where readily available (eg the EA web site) may be used for cross reference.

Groundwater

6.6.6 The study area can roughly be divided into two with regard to groundwater vulnerability. With the exception of an arc around Hastings, the remainder of the study area is primarily major and minor aquifers. The arc around Hastings, which is the outcrop of the Wealden and Gault clays is essentially non-aquifer.

6.6.7 The major aquifers are the Upper Greensand and the Chalk in which groundwater flow is intergranular and predominantly fracture flow respectively. Yields under the right conditions can be significant and support large public supply abstractions for the majority of the population. The Chalk is the single most important aquifer both nationally and regionally, and occupies approximately 40% of the study area. Within the Southern Region of the Environment Agency it provides over 70% of public water supplies and 85% of all groundwater abstractions. The integrity and protection of these sources is therefore a very important issue and every precaution must be taken to ensure they are not contaminated as a consequence of transportation measures. Contamination could result from the discharge of runoff or spillage of chemicals. The vulnerability of these aquifers to contamination depends upon the flow mechanism and the ability of the unsaturated zone to attenuate contaminants. As a result , a significant proportion of the area is highly vulnerable to contamination.

6.6.8 For the minor aquifers, such as the Lower Greensand and the Hastings Beds, typically sand horizons within a major clay sequence, groundwater flow can be restricted to intergranular flow, localised fractures and weathered zones, and therefore yields are relatively low. They can, however, be an important local supply source, and where mains water is unavailable in rural communities, these

minor aquifers may be the only source available and must therefore be protected. As a consequence of shallow water tables, groundwater in these minor aquifers is often vulnerable to contamination

6.6.9 Under the Water Resources Act 1991, the Environment Agency has a duty to monitor and protect the quality of groundwater (Section 84) and to conserve its use for water resources (Section 19). It also has a duty (Section 16) to maintain, and where appropriate, enhance conservation of the surface water environment.

6.6.10 The Agency has developed a policy framework for protecting groundwater. This framework is based on the vulnerability of groundwaters to pollution and the need to prevent pollution of the groundwater that drains to a groundwater abstraction point, known as a Source Protection Zone (SPZ). The Agency's policies relate to preventing certain types of development or engineering, to minimise risk in areas where groundwater is vulnerable to pollution and in SPZs. These policies are set out in the Policy and Practice for the Protection of Groundwater.

Surface Waters

6.6.11 All surface water bodies that are either crossed by a transportation route or receive runoff are vulnerable to contamination through both routine discharge and spillage of contaminants. The level of hazard will be increased when these discharges occur upstream of a public water supply abstraction point. The setting of objectives for river water quality in response to European Directives and their implementation under UK law falls within the remit of the EA. The EA would discourage any new development that poses a threat to the quality of surface water bodies but conversely, should encourage any development that allows for an improvement in river quality (however poor the existing water quality may be). Upgrading the method of disposal of drainage waters from existing road or rail schemes may thus be considered to contribute to enhancement of the water environment.

6.6.12 Significant flooding problems in the south east during the winter of 2000/01 have emphasised the need for determining the impact of any development on flooding potential. New transportation links may lead to an increased risk of flooding. The EA seek to guide new development and re-development away from areas where there is an unacceptable risk of flooding. Both locally and within the strategic context, nationally applied guidance must be followed in regional strategic planning, this should include:

- The principles set out in Planning Policy Guidance Note 25 (PPG25 – Development and Flood Risk) that establish flooding as a material planning issue to which the precautionary principle is applied including the consideration of conditions brought about by climate change.

6.6.13 On this basis there is a general presumption against new development within the flood routes and flood storage areas, unless it can be demonstrated that the proposal would not itself, or cumulatively in conjunction with other development:

- impede the flow of flood water;
- reduce the capacity of the floodplain to store water;
- increase the number of people or properties at risk from flooding;
- obstruct land adjacent to watercourses required for access and/or maintenance purposes; and
- cause unacceptable effects to the environment;

6.6.14 To avoid these risks flood plains should be avoided wherever possible.

6.6.15 Increased flood risk may also arise from drainage of large impermeable areas (eg road carriageways; airport runways and aprons) with high run off rates and little attenuation of flow.

6.6.16 Appropriate drainage control measures must be employed where risks of flooding have been identified.

Appraisal

6.6.17 Groundwater - Despite lower scores than other elements in the strategy ,the Lewes-Beddingham (junctions lie over SPZs). For all these developments there is the potential for significant impacts on the groundwater environment unless mitigation measures are applied.

6.6.18 Surface Water Quality - the most significant impacts identified arise from:

- A27 Lewes to Beddingham Scheme (off-line)

6.6.19 The impacts arise from the river crossings and the potential impact that this may have on the surface water, both with respect to drainage and with respect to

impacts during construction. The off-line road schemes include new alignments that will require new river crossing with the associated impact.

6.6.20 It should be noted that as a significant number of the schemes occur on the chalk (where there is little surface water), in general terms the overall impact on surface water is relatively limited.

Potential Mitigation and Strategic Balance

6.6.21 A range of mitigation measures are available for the impact of road and rail transport schemes on the water environment, these include:

- adopting appropriate methods and following established guidelines during construction;
- lined drainage over sensitive groundwaters;
- soakaways designed to minimise impact;
- provision of oil separators and sediment traps in drainage;
- provision of containment for spillage;
- provision of in-line "treatments" such as reed beds;
- design of bridges/culverts etc to minimise effect on flood flow regimes;
- attenuation measures for road drainage to reduce "flashiness" of flow; and
- provision of alternate flood storage to replace that lost.

6.6.22 Such mitigation may minimise impacts (in the case of new developments) and actually produce positive impact (benefit) where existing routes are being upgraded. (see below).

6.6.23 A differentiation thus needs to be made between those route improvements, which comprise new alignments, and those that essentially follow existing routes. This is on the basis that an upgrade of an existing route may offer the potential to introduce new drainage measures, designed to minimise impact on the water environment. Where these replace former drainage, potentially an environmental benefit may accrue and within the overall balance of the strategy this may reduce the significance of the impact

7 Appraisal Summary Tables

7 Appraisal Summary Tables

7.1 ***Introduction***

7.1.1 The appraisal of the East of Lewes SDPs has been based on the Guidance on the Methodology for Multi-Modal Studies (GOMMMS). There are 4 main parts to the GOMMMS appraisal process, which are:

- An Appraisal Summary Table (AST) which gives a summary appraisal against Central Government's five objectives for transport.
- An assessment of the degree to which the local and regional objectives identified would be achieved by the strategy.
- An assessment of the degree to which the problems identified would be ameliorated by the strategy, compared to the situation if there was no positive policy intervention.
- Supporting analyses of distribution and equity, affordability and financial sustainability and practicality and public acceptability. This will also include the issue of scheme "deliverability".

7.1.2 The AST is intended to be a summary of the appraisal against the Governments five objectives for transport and their associated sub-objectives which are described below.

- The **environment** objective is to protect the built and natural environment, and has the following sub-objectives:
- *to reduce* ***noise****,*
- *to improve* ***local air quality****,*
- *to protect and enhance the* ***landscape****,*
- *to protect and enhance the* ***townscape****,*
- *to protect the* ***heritage of historic resources****,*
- *to support* ***biodiversity****,*
- *to protect the* ***water environment****,*
- *to encourage* ***physical fitness****, and*
- *to improve* ***journey ambience****.*

- The **safety** objective is simply to improve safety, and has the following sub-objectives:
- *to reduce* ***accidents****, and*

- *to improve* ***security***.

- The **economy** objective is to support sustainable economic activity and get good value for money, and has the following sub-objectives:
- *to improve* ***transport economic efficiency****,*
- *to improve* ***reliability****, and*
- *to provide beneficial* ***wider economic impacts***.

- The **accessibility** objective is to improve access to facilities for those without a car and to reduce severance, and has the following sub-objectives:
- *to improve* ***access to the transport system****,*
- *to increase* ***value options****, and*
- *to reduce* ***severance***.

- The **integration** objective is to ensure that all decisions are taken in the context of the Government's integrated transport policy and has the following sub-objectives:
- *to improve* ***transport interchange****,*
- *to integrate transport policy with* ***land-use policy****, and*
- *to integrate transport policy with* ***other Government policies***.

7.2 Economic Appraisal

7.2.1 Each of the three road schemes at Selmeston, Beddingham and Wilmington have been subject to an economic assessment. For each scheme an engineering cost has been derived. Travel time and travel distance matrices have been derived from the SATURN model for the scheme and do-minimum scenarios. These have been input into TUBA for assessment purposes.

7.3 Scheme Costs

7.3.1 The scheme costs for the three preferred route options are outlined in Table 8.1. The original cost estimates were derived in 1997 prices. These have been uprated to 2001 costs. These show that Wilmington bypass would cost £31.6m, Selmeston would cost £10.6m and Southerham to Beddingham would cost £22.7m.

Table 8.1– Summary of Current Scheme Costs

Proposed Scheme	**Length of route (km)**	**Standard of proposed route/ junction**	**Initial cost (£m)**	**Date of initial cost**	**Total cost (£)**		**Year 2001 Q4 cost (£)**
					Low range cost	**High range cost**	
A27 Lewes to Polegate Improvements							
Wilmington Bypass	5.8	D2AP	27.0	1997			31.6
		WS2			10.4	19.1	
Selmeston Bypass	2.8	D2AP	9.1	1997			10.6
		WS2			5.0	9.2	
Southerham to Beddingham Improvement	2.4	D2AP	19.4	1997			22.7

7.4 ***TUBA Analysis***

7.4.1 Each of the preferred routes have been subject to an economic appraisal. Table 8.2 provides a summary of the tests. These indicate that the schemes have positive cost benefit ratios.

Scheme	**Scheme Cost £**	**Benefit Cost Ratio**
Southerham-Beddingham	22.7m	12.717
Selmeston D2	10.6	1.481
Wilmington D2	31.6	1.561

Table 8.2 Economic Assessment

7.5 ***Appraisal Summary Tables***

7.5.1 The partial AST tables for each scheme are given below. The impacts on noise and air pollution need to be assessed in more detail in later design work.

Appraisal Summary Table		Southerham- Beddingham	Problems	Scheme Cost £ 22.7M
OBJECTIVE	**SUB- OBJECTIVE**	**QUALITATIVE IMPACTS**	**QUANTITATIVE MEASURE**	**ASSESSMENT**
ENVIRONMENT	**Noise**			
	Local Air Quality			
	Greenhouse Gases			
	Landscape	The flyover is likely to have a particularly adverse visual impact on the open landscape of the South Downs AONB and on the setting of Beddingham even taking account of the route staying online or broadly within the existing road corridor..		Large Negative *
	Townscape	There are scattered buildings in the area, together with the village of Beddingham, which will have their townscape adversely affected.		Moderate Negative
	Heritage of Historic Resources	The proposed scheme will probably affect at least three SAMs. The scheme will also probably affect a range of archaeological/palaeo-environmental remains sealed in or below the alluvial deposits of the valley floor		Moderate Negative
	Biodiversity	The construction of the roundabout and possible landtake could have a minor adverse impact on Lewes Brooks SSSI and Beddingham Grazing Marsh and Lewes Railway Land SNCIs.		Minor Adverse
	Water Environment	Potential impact of alignment on the flood plain. The impact will be dependent on the design.		
	Physical Fitness	Introduction of soft measures that promote walking and cycling will contribute to improving physical fitness		Beneficial Impact
	Journey Ambience	The new infrastructure will also reduce traveller stress as will reduced access times to stations.		Large Beneficial Impact
SAFETY	**Accidents**	Significant accident savings associated with new highway infrastructure.		Beneficial Impact
	Security			
ECONOMY	**Transport Economic Efficiency**			Benefit/Cost ratio BCR=12.71
	Reliability	Improvements to the transport networks will enhance capacity and improve journey time reliability for road and rail users.		Moderate Beneficial Impact
	Wider Economic Impacts	Improve access to priority regeneration areas in East Sussex		Beneficial Impact
ACCESSIBILITY	**Option Values**			Not applicable
	Severance			Limited impact
	Access to the Transport System	Positive impacts are associated with improved bus services in the area		Beneficial Impact
INTEGRATION	**Transport Interchange**	Improved interchange between rail and other modes e.g. slow modes and rambler buses		Beneficial Impact
	Land-Use Policy	Performs well against national and regional guidance as well as LTP's and Structure Plans		Beneficial Impact
	Other Government Policies	Consistent with other Government policies relating to access to employment opportunity, reducing road accidents.		Beneficial Impact

Appraisal Summary Table		Selmeston Bypass	Problems	Scheme Cost £10.6 M
OBJECTIVE	**SUB- OBJECTIVE**	**QUALITATIVE IMPACTS**	**QUANTITATIVE MEASURE**	**ASSESSMENT**
ENVIRONMENT	**Noise**			
	Local Air Quality			
	Greenhouse Gases			
	Landscape	The bypass will have detrimental impacts on landscape patterns, tranquillity, cultural landscape and landcover.		Moderate Negative
	Townscape	The scheme will have benefits for the settlements within the area, such as Selmeston and some scattered farms.		Moderate Positive
	Heritage of Historic Resources	The scheme will directly impact upon and sever the historic landscape of the study area as well as affecting the setting of Firfe park. The site may potentially impact currently unidentified assets from a range of periods		Moderate Negative
	Biodiversity	The Firfe Escarpment SSSI and Tilton Wood SNCI are far enough from the proposed road as not to be affected		Neutral
	Water Environment	Potential impact on the surface water, both with respect to drainage and with respect to impacts during construction. However mitigation can provide an overall net benefit.		Neutral
	Physical Fitness	Introduction of soft measures that promote walking and cycling will contribute to improving physical fitness		Beneficial Impact
	Journey Ambience	The new infrastructure will also reduce traveller stress for road users.		Beneficial Impact
SAFETY	**Accidents**	Significant accident savings associated with new highway infrastructure.		Beneficial Impact
	Security			
ECONOMY	**Transport Economic Efficiency**			Benefit Cost ratio =1.481
	Reliability	Improvements to the transport networks will enhance capacity and improve journey time reliability for road users		Beneficial Impact
	Wider Economic Impacts	Improve access to priority regeneration areas in East Sussex		Beneficial Impact
ACCESSIBILITY	**Option Values**			
	Severance	The Bypass will reduce severance for the residents of Selmeston		Large Beneficial
	Access to the Transport System	Positive impacts are associated with improved bus services in the area		Beneficial Impact
INTEGRATION	**Transport Interchange**	Improved interchange between rail and other modes e.g. slow modes and rambler buses		Beneficial Impact
	Land-Use Policy	Performs well against national and regional guidance as well as LTP's and Structure Plans		Beneficial Impact
	Other Government Policies	Consistent with other Government policies relating to access to employment opportunity, reducing road accidents.		Beneficial Impact

Appraisal Summary Table		Wilmington Bypass	Problems	Scheme Cost £31.6M
OBJECTIVE	**SUB- OBJECTIVE**	**QUALITATIVE IMPACTS**	**QUANTITATIVE MEASURE**	**ASSESSMENT**
ENVIRONMENT	**Noise**			
	Local Air Quality			
	Greenhouse Gases			
	Landscape	The scheme is likely to have a detrimental impact on landscape pattern and landscape particularly, albeit some sections are online or in close proximity to existing road/rail routes.		Moderate Negative
	Townscape	There will be benefits for the settlements within the area, such as Selmeston and Wilmington		Slight Positive
	Heritage of Historic Resources	The scheme will directly impact on and sever the historic landscape of the study area. The scheme may impact on the setting and amenity value of Wilmington, Wootton Manor and Berwick. The scheme may have a beneficial impact on the amenity value of Wilmington Green		Moderate Negative
	Biodiversity	The two SSSI's (Milton Gate Marshand Arlington Reservoir) and the Monkyn Pyn SNCI all support a breeding bird community		Minor Adverse
	Water Environment	Potential impact on the surface water, both with respect to drainage and with respect to impacts during construction. However mitigation can provide an overall net benefit.		Neutral
	Physical Fitness	Introduction of soft measures that promote walking and cycling will contribute to improving physical fitness		Beneficial Impact
	Journey Ambience	The new infrastructure will reduce traveller stress for road users.		Beneficial Impact
SAFETY	**Accidents**	Accident savings associated with new highway infrastructure.		Beneficial Impact
	Security			
ECONOMY	**Transport Economic Efficiency**			Benefit Cost Ratio 1.561
	Reliability	Improvements to the transport networks will enhance capacity and improve journey time reliability for road users		Beneficial Impact
	Wider Economic Impacts	Improve access to priority regeneration areas in East Sussex		Beneficial Impact
ACCESSIBILITY	**Option Values**			
	Severance			Limited Impact
	Access to the Transport System			
INTEGRATION	**Transport Interchange**	Improved interchange between rail and other modes e.g. slow modes and rambler buses		Beneficial Impact
	Land-Use Policy	Performs well against national and regional guidance as well as LTP's and Structure Plans		Beneficial Impact
	Other Government Policies	Consistent with other Government policies relating to access to employment opportunity, reducing road accidents.		Beneficial Impact

8 Summary

8 Summary

8.1 ***Overall***

8.1.1 This Strategy Development Plan has considered the traffic bottleneck that exists on A27, east of Lewes. The characteristics of this area are:

- high car ownership;
- limited bus services on the A27 corridor;
- traffic flows at Beddingham in excess of Highways Agency congestion reference flow;
- delays on the section between Southerham to Beddingham; and
- road safety issues at Selmeston.

8.1.2 An existing AM peak SATURN highway model was used to examine traffic impacts in 2016. The summary of the traffic impacts in the future:

- the model shows that the A27 westbound is congested now (two A26 roundabouts & level crossing);
- there is less congestion eastbound in the morning peak;
- in the worst case (with future developments required to fulfill East Sussex County Council Structure Plan Requirements), traffic increases by 42% in the 2016 do-minimum situation; and
- do-minimum travel times are in some cases 60% worse than at present.

8.1.3 Although not modelled, the PM peak situation is likely to show increased congestion in the westbound direction.

8.1.4 The introduction of soft measures was deemed capable of reducing demand by 10%-20% (maximum considered possible). This would only have a limited effect on ameliorating congestion.

8.1.5 The individual schemes are not forecast to generate a significant increase in traffic on A27. There is likely to be a slight reduction in traffic on B2124 as a result of the Beddingham improvements.

8.2 ***Beddingham***

8.2.1 The forecast traffic flows indicate need for additional capacity. The delays at the Beddingham level crossing will increase significantly with the implementation of the increased East Coastway train frequencies as proposed in the SoCoMMS rail strategy.

- Flows indicate D2 standard needed;
- Reduces AM peak travel times by 6 minutes westbound, between Lewes and Polegate, compared with the 2016 do-minimum situation;
- Lewes Roundabout acts as constraint if restraint at Beddingham is released;
- Increase on A26 flows from/to Newhaven by 400 vehicles in all development scenarios (background, brownfield and greenfield);
- Scheme Cost £23m;
- The scheme provides a positive benefit-cost ratio; and
- There are large impacts on the physical environment, particularly in terms of landscape. Beddingham is within the South Downs Area of Outstanding Natural Beauty.

8.3 ***Selmeston***

8.3.1 The summary of the findings for Selmeston indicate:

- Large numbers of accidents compared to other parts of the corridor (17 crashes in 3 years), requiring the need for safety improvements;
- AADT traffic flows are forecast to be up to 29,000 vehicles in 2016 on this section of A27;
- The provision of a bypass would have little impact on journey times, whether WS2 or D2;
- The bypass would provide safety improvements;
- Scheme Cost £9.2m WS2 - £10.6m D2; and
- There are large impacts on the physical environment, particularly in terms of landscape. Selmeston is on the edge of the South Downs Area of Outstanding Natural Beauty.

8.4 ***Wilmington***

8.4.1 The findings of the study indicate:

- Traffic growth increases stress on link. AADT traffic flows could be up to 26,000 vehicles per day in 2016;

- The Preferred route - has greatest impact on journey times as it provides a more direct route;
- There would be safety improvements;
- The scheme would improve the human environment within Wilmington;
- There would be an impact on the physical environment; and
- Scheme Cost WS2 =£19m D2 =£31.6m.

8.5 ***Strategy Recommendations***

- Provision of bypasses (including Southerham to Beddingham scheme);
- Improvements on Hailsham- Polegate- Eastbourne corridor for buses;
- Rail service enhancements;
- Enhancements to Rambler bus connections between AONB and Lewes/ Polegate stations; and
- Cycleway provision on improved A27.

8.6 ***Further Work***

Further work should include the examination of traffic flows projected to 2030, to assess how the highway improvements perform under even greater levels of congestion the standard of scheme improvement that may be required.

Annex- Model Results- Background Growth

		North/South Screenline											
		A27 Ebnd	A27 Wbnd	A27 Total	Diff vs Base	A259Ebnd	A259 Wbnd	A259 Total	Diff vs Base	B2124 Ebnd	B2124 Wbnd	B2124 Total	Diff vs Base
AM Base	2002	643	1003	1646	-	904	1151	2055	-	191	407	598	-
Do Noth	2016	638	1326	1964	19.3%	1069	1363	2432	18.3%	158	416	574	-4.0%
Do Min	2016	638	1399	2037	23.8%	1061	1320	2381	15.9%	164	445	609	1.8%
Op2	2016	656	1453	2109	28.1%	1067	1371	2438	18.6%	159	402	561	-6.2%
Op3	2016	647	1444	2091	27.0%	1067	1368	2435	18.5%	164	407	571	-4.5%
Op4	2016	641	1477	2118	28.7%	1067	1349	2416	17.6%	184	408	592	-1.0%
Op5	2016	663	1502	2165	31.5%	1061	1332	2393	16.4%	159	374	533	-10.9%
Op6	2016	704	1523	2227	35.3%	1062	1341	2403	16.9%	176	375	551	-7.9%
Op7	2016	654	1455	2109	28.1%	1067	1353	2420	17.8%	166	403	569	-4.8%
Op7d	2016	694	1525	2219	34.8%	1060	1333	2393	16.4%	174	378	552	-7.7%
Op8	2016	662	1497	2159	31.2%	1062	1356	2418	17.7%	159	370	529	-11.5%

		East/West Screenline										
		A26 Nbnd	A26 Sbnd	A26 Total	Diff vs Base	A22 Nbnd	A22 Sbnd	A22 Total	Diff vs Base	PB Nbnd	PB Sbnd	PB Total
AM Base	2002	551	446	997	-	1032	1014	2046	-	-	-	-
Do Noth	2016	627	395	1022	2.5%	1270	1180	2450	19.7%	-	-	-
Do Min	2016	633	454	1087	9.0%	1113	1043	2156	5.4%	1081	670	1751
Op2	2016	823	618	1441	44.5%	1088	1036	2124	3.8%	1052	658	1710
Op3	2016	828	621	1449	45.3%	1083	1043	2126	3.9%	1050	653	1703
Op4	2016	826	646	1472	47.6%	1086	1044	2130	4.1%	1110	697	1807
Op5	2016	815	625	1440	44.4%	1086	1032	2118	3.5%	1049	657	1706
Op6	2016	829	648	1477	48.1%	1130	1015	2145	4.8%	1025	709	1734
Op7	2016	833	645	1478	48.2%	1135	1042	2177	6.4%	1019	659	1678
Op7d	2016	827	655	1482	48.6%	1132	1044	2176	6.4%	1018	665	1683
Op8	2016	814	625	1439	44.3%	1083	1050	2133	4.3%	1049	646	1695

		East/West Screenline				North/South Screenline			
		Nbnd	Sbnd	Total	% Diff vs DM	Ebnd	Wbnd	Total	% Diff vs DM
AM Base	2002	1583	1460	3043	-	1738	2561	4299	-
Do Noth	2016	1897	1575	3472	-	1865	3105	4970	-
Do Min	2016	2827	2167	4994	-	1863	3164	5027	-
Op2	2016	2963	2312	5275	5.6%	1882	3226	5108	1.6%
Op3	2016	2961	2317	5278	5.7%	1878	3219	5097	1.4%
Op4	2016	3022	2387	5409	8.3%	1892	3234	5126	2.0%
Op5	2016	2950	2314	5264	5.4%	1883	3208	5091	1.3%
Op6	2016	2984	2372	5356	7.2%	1942	3239	5181	3.1%
Op7	2016	2987	2346	5333	6.8%	1887	3211	5098	1.4%
Op7d	2016	2977	2364	5341	6.9%	1928	3236	5164	2.7%
Op8	2016	2946	2321	5267	5.5%	1883	3223	5106	1.6%

Model Results- Brownfield Growth

		North/South Screenline											
		A27 Ebnd	A27 Wbnd	A27 Total	Diff vs Base	A259Ebnd	A259 Wbnd	A259 Total	Diff vs Base	B2124 Ebnd	B2124 Wbnd	B2124 Total	Diff vs Base
AM Base	2002	643	1003	1646		904	1151	2055	-	191	407	598	
Do Noth	2016												
Do Min	2016	679	1440	2119	28.7%	1078	1324	2402	16.9%	166	431	597	-0.2%
Op2	2016	690	1465	2155	30.9%	1087	1378	2465	20.0%	163	397	560	-6.4%
Op3	2016	681	1449	2130	29.4%	1087	1377	2464	19.9%	169	405	574	-4.0%
Op4	2016	679	1486	2165	31.5%	1088	1357	2445	19.0%	181	398	579	-3.2%
Op5	2016	698	1509	2207	34.1%	1080	1370	2450	19.2%	163	364	527	-11.9%
Op6	2016	746	1548	2294	39.4%	1080	1344	2424	18.0%	182	361	543	-9.2%
Op7	2016	878	1454	2332	41.7%	1091	1391	2482	20.8%	60	268	328	-45.2%
Op7d	2016	959	1508	2467	49.9%	1083	1304	2387	16.2%	54	258	312	-47.8%
Op8	2016	876	1501	2377	44.4%	1079	1378	2457	19.6%	54	267	321	-46.3%

		East/West Screenline										
		A26 Nbnd	A26 Sbnd	A26 Total	Diff vs Base	A22 Nbnd	A22 Sbnd	A22 Total	Diff vs Base	PB Nbnd	PB Sbnd	PB Total
AM Base	2002	551	446	997	-	1032	1014	2046	-			
Do Noth	2016											
Do Min	2016	618	444	1062	6.5%	1119	1090	2209	8.0%	1095	716	1811
Op2	2016	821	598	1419	42.3%	1095	1089	2184	6.7%	1059	702	1761
Op3	2016	822	596	1418	42.2%	1090	1084	2174	6.3%	1055	703	1758
Op4	2016	823	623	1446	45.0%	1091	1098	2189	7.0%	1091	735	1826
Op5	2016	811	596	1407	41.1%	1107	1090	2197	7.4%	1060	703	1763
Op6	2016	822	627	1449	45.3%	1534	1158	2692	31.6%	1184	709	1893
Op7	2016	816	644	1460	46.4%	1576	1175	2751	34.5%	1101	811	1912
Op7d	2016	816	652	1468	47.2%	1569	1161	2730	33.4%	1101	805	1906
Op8	2016	817	652	1469	47.3%	1508	1122	2630	28.5%	1151	810	1961

		East/West Screenline				North/South Screenline			
		Nbnd	Sbnd	Total	% Diff vs DM	Ebnd	Wbnd	Total	% Diff vs DM
AM Base	2002	1583	1460	3043	-	1738	2561	4299	-
Do Noth	2016	0	0	0	-	0	0	0	-
Do Min	2016	2832	2250	5082	-	1923	3195	5118	-
Op2	2016	2975	2389	5364	5.5%	1940	3240	5180	1.2%
Op3	2016	2967	2383	5350	5.3%	1937	3231	5168	1.0%
Op4	2016	3005	2456	5461	7.5%	1948	3241	5189	1.4%
Op5	2016	2978	2389	5367	5.6%	1941	3243	5184	1.3%
Op6	2016	3540	2494	6034	18.7%	2008	3253	5261	2.8%
Op7	2016	3493	2630	6123	20.5%	2029	3113	5142	0.5%
Op7d	2016	3486	2618	6104	20.1%	2096	3070	5166	0.9%
Op8	2016	3476	2584	6060	19.2%	2009	3146	5155	0.7%