

Government Office for the South West
London to South West and South Wales
Multi-Modal Study
SWARMMS Appraisal Report
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1 Introduction

1.1 *Context of Report*

1.1.1 This report provides further information for stakeholders on the SWARMMS appraisal work which has been undertaken up to mid June 2001. It is intended to assist stakeholders in commenting on the Emerging Strategy.

1.1.2 The report has four further sections, namely:

- Chapter 2 : describes the four Composite Strategies
- Chapter 3 : describes the appraisal of the four Composite Strategies
- Chapter 4 : describes the Emerging Strategy
- Chapter 5 : describes the appraisal of the Emerging Strategy

2 The Composite Strategies

2.1 *Introduction*

2.1.1 It was decided to develop four Composite Strategies, each of which would be subject to a full GOMMMS appraisal. This chapter describes the reasoning which led to the development of the four Composite Strategies and describes their content.

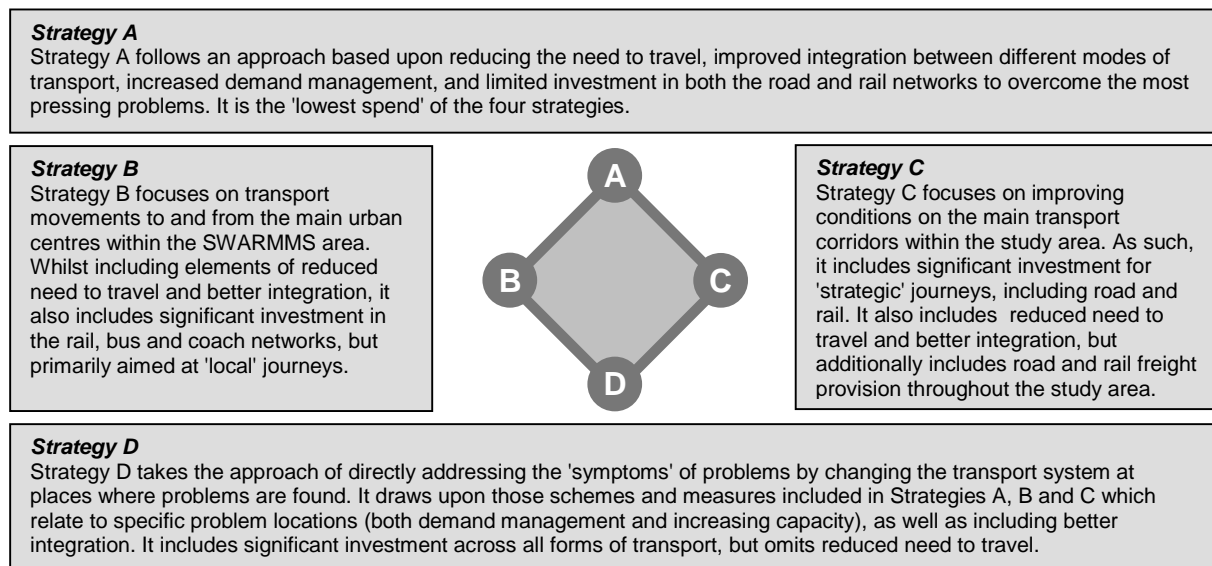
2.2 *Strategy Developments*

2.2.1 The purpose of the Composite Strategies, and their appraisal, is to assist in developing the Emerging Strategy. As such, it is important that the Composite Strategies are sufficiently different from one-another so that the relative merits of alternative approaches to addressing the study area's problems and issues can be established.

2.2.2 Similarly, it is important that each Composite Strategy is itself a legitimate and holistic attempt at addressing the problems and issues. Hence, each Composite Strategy should be multi-modal in approach, albeit with a different philosophy and component parts.

2.2.3 For these reasons it was decided to develop four Composite Strategies, shown in Figure 2.1. The content of each of the four Composite Strategies is described in the next sections.

Figure 2.1 : The Four Composite Strategies



2.3

2.3.1

Strategy A

The content of Strategy A can be summarised as follows:

- Changing travel demand
- Integration measures – public transport services, interchanges, information
- Demand management – motorway access controls, ITS measures, traffic control measures
- Local action – parking policies
- Local action – congestion charging or similar in PUAs
- Local action – enhanced cycle routes
- Local action – bus measures including bus-based park and ride
- Public transport rail – small number of new local rail stations
- Public transport rail – improved station facilities
- Public transport rail – improved station accessibility
- Public transport coach – improved coach services (frequency and journey times)
- Public transport coach – improved vehicles and passenger facilities, including new coachways
- Public transport coach – improved accessibility to coach stops/coachways (on demand taxi buses)
- Highway schemes – Local ‘Hot Spot’ schemes and ‘Making Better Use’ schemes
- Highway schemes – Local road safety initiatives
- Tourism related measures

2.4

2.4.1

Strategy B

The content of Strategy B can be summarised as follows:

- Local action – local highway schemes
- Local action – parking policies
- Local action – congestion charging or similar in PUAs
- Local action – significant number of new local rail stations
- Local action - Bristol LRT
- Local action – enhanced cycle routes
- Local action – bus measures including bus-based park and ride
- Public transport rail – improved local rail services
- Public transport rail – improved station facilities
- Public transport rail – improved station accessibility

- Public transport coach – improved accessibility to coach stops (on demand taxi buses)
- Highway schemes – local ‘Hot Spots’ and local ‘Making Better Use’, ‘safety initiatives
- Supporting measures – Changing travel demand, Integration measures

2.5

2.5.1

Strategy C

The content of Strategy C can be summarised as follows:

- Highway schemes –upgrading of A303, A30 and A38
- Highway schemes – ‘Hot Spots’ and ‘Making Better Use’
- Public transport rail – new strategic stations
- Public transport rail – new/improvement of rail infrastructure
- Public transport rail – new/higher frequency services
- Public transport rail – improved station facilities
- Public transport rail – improved station accessibility
- Public transport coach – improved coach services (frequency and journey times)
- Public transport coach – improved vehicles and passenger facilities, including new coachways
- Public transport coach – improved accessibility to coach stops/coachways (on -demand taxi buses)
- Local action – local highways schemes
- Demand management – access controls, traffic management, ITS measures
- Freight – new multi modal freight facilities
- Freight – upgrading of loading gauge on rail routes
- Freight – increased provision of land bridge services (piggy back services)
- Tourism related measures
- Airport and air service measures –surface access improvements to regional airports
- Supporting measures – Changing travel demand, Integration measures

2.6

2.6.1

Strategy D

The content of Strategy D can be summarised as follows:

- Highway schemes –upgrading of A303, A30 and A38 (not including A303 Ilminster - Honiton)
- Highway schemes – M4 and M5 widening
- Highway schemes – local road safety schemes

- Highway schemes – ‘Hot Spot’ and ‘Making Better Use’ schemes
- Local action – congestion charging or similar in Bristol, Swindon, Taunton, Exeter and Reading and on neighbouring motorways
- Public transport rail – new strategic stations
- Public transport rail – new/improvement of infrastructure
- Public transport rail – new/higher frequency services
- Public transport rail – improved station facilities
- Public transport rail – improved station accessibility
- Public transport coach – improved coach services (frequency and journey times)
- Public transport coach – improved vehicles and passenger facilities, including new coachways
- Public transport coach – improved accessibility to coach stops/coachways (on demand taxi buses)
- Demand management – access controls, traffic management, ITS measures
- Freight – new multi modal freight facilities
- Freight – upgrading of loading gauge on rail routes
- Freight – increased provision of land bridge services (piggy back services)
- Tourism related measures
- Airport and air service measures –surface access improvements to regional airports
- Supporting measures – Integration measures

2.7

Summary of Composite Strategies

2.7.1

Table 2.1 summarises the content of the four Composite Strategies, showing where the different emphases lie.

Table 2.1: SWARMMS Strategy Composition Summary

Measures	Strategy A	Strategy B	Strategy C	Strategy D
Changing Travel Demand	***	**	**	-
Integration measures	***	**	**	**
Next Generation Developments	**	**	**	*
Local Action	**	***	*	**
Demand Management	**	*	**	**
PT Rail	*	**	***	***
PT Coach	**	*	***	***
Highway Schemes	*	*	**	***

Measures	Strategy A	Strategy B	Strategy C	Strategy D
Freight	*	*	***	***
Tourism measures	*	*	**	**
Airport and Air Services	*	*	**	**

Key

- *** Major component of strategy
- ** Significant supporting component of strategy
- * Minor component of strategy

3 Appraisal of the Composite Strategies

3.1 *Introduction*

3.1.1 This chapter describes the full GOMMMS appraisal of the four Composite Strategies. It begins by explaining the requirements of GOMMMS and how the SWARMMS study has addressed these. It goes on the detail the results of the appraisal, concluding with a discussion of the key findings as they influence the development of an Emerging Strategy.

3.2 *The GOMMMS Appraisal*

3.2.1 GOMMMS makes a clear distinction between a transport strategy (i.e. some general, perhaps area-wide, policies aimed at dealing with a number of problems) and a transport plan (i.e. a collection of interventions to solve individual problems or close groups of problems), and provides guidance for the appraisal of both. By definition, the guidance provided for the appraisal of a transport strategy is more general and less reliant upon specific detail. For the avoidance of doubt, it should be noted that the four Composite Strategies, and the Emerging Strategy, are to be appraised at 'strategy' level.

3.2.2 The appraisal draws upon three interrelated strands, namely:

- Appraisal Summary Tables (ASTs);
- Additional Appraisal Criteria (AAC); and
- Supporting Analyses.

3.2.3 The structure of the AST is defined in GOMMMS to include 21 sub-objectives which nest within the Government's five main objectives. These are as follows:

- Environment : Noise, Local Area Quality, Greenhouse Gases, Landscape, Townscape, Heritage of Historic Resources, Biodiversity, Water Environment, Physical Fitness and Journey Ambience.
- Safety : Accidents and Security.
- Economy : Transport Economic Efficiency, Reliability and Wider Economic Impacts.
- Accessibility : Option Values, Severance and Access to the Transport System.

- Integration : Transport Interchange, Land-Use Policy and other Government Policies.

3.2.4

As a result of assessing the problems and issues for the SWARMMS study area, it was decided to develop seven Additional Appraisal Criteria (AAC) to sit alongside the ASTs in the appraisal process. Consistent with GOMMMS, the AAC address topics either not covered at all within the AST, or specific topics which are subsumed within the AST's 21 sub-objectives. They are as follows:

- to reduce the need to travel;
- to increase the proportion of journeys made by non-car modes in the study area;
- to improve connectivity within the study area;
- to reduce the peripherality of Devon and Cornwall;
- to reduce congestion at key locations on the road network;
- to reduce congestion at key locations on the rail network; and
- to reduce seasonal congestion at key locations on the road network.

3.2.5

As suggested by GOMMMS, the appraisal of the four Composite Strategies also considers the supporting analyses of:

- Distribution and equity;
- Affordability and financial sustainability; and
- Practicality and public acceptability.

This provides a more focused view of the implications of the strategies for particular groups of users, non-users, operators and public sector authorities.

3.3

Results of the Appraisal - ASTs

3.3.1

The ASTs for each of the four Composite Strategies are presented in Figures 3.1 to 3.4.

3.4

Results of the Appraisal – AAC

3.4.1

The findings from the seven Additional Appraisal Criteria are summarised below. The results are presented such that the four Composite Strategies can be compared both against each other and against the 'Do Minimum'.

(1) *Reducing the need to travel*

Table 3.1 : Reducing the need to travel

Total passenger kilometres (rail and car) – millions @ 2016

	Do Minimum	Strategy A	Strategy B	Strategy C	Strategy D
Whole study area	20.02	16.80	17.17	17.17	18.93
% change from 2000	37.9%	15.7%	18.2%	18.2%	30.4%
% change from Do Min	-	-16.1%	-14.2%	-14.2%	-5.4%

Total Passenger kilometres (car) – millions @ 2016

	Do Minimum	Strategy A	Strategy B	Strategy C	Strategy D
Whole study area	19.05	15.87	16.27	16.26	17.99
% change from 2000	37.1%	14.2%	17.1%	17.0%	29.4%
% change from Do Min	-	-16.7%	-14.6%	-14.6%	-5.6%

Comment: Strategy A, following on from its design, has greatest success in reducing the need to travel, followed by Strategies B and C. Even Strategy D, which did not include any specific traffic reduction measures, achieves a 5% reduction compared to the Do Minimum as a result of its new infrastructure influencing route choice.

(2) *To increase the proportion of journeys made by non-car modes in the study area*

Table 3.2 : Percentage of rail passenger kilometres – @ 2016

	Do Minimum	Strategy A	Strategy B	Strategy C	Strategy D
% rail trips	4.9%	5.5%	5.2%	5.3%	5.0%

Comment : Strategy A is the most successful in increasing the proportion of journeys made by rail, with Strategy D the least successful. All strategies are better than both the Do Minimum and the 2000 base case (at 4.3%).

(3) *To improve connectivity within the study area*

Table 3.3 : Improving connectivity

Journey times (Road and Rail) – minutes @ 2016

	Do Minimum	Strategy A	Strategy B	Strategy C	Strategy D
Plymouth-Bristol (car)	151	142	144	143	150
Plymouth-Bristol (rail)	156	156	156	156	156
Taunton-Reading (car)	137	120	121	118	121
Taunton-Reading (rail)	130	131	133	127	127

	Do Minimum	Strategy A	Strategy B	Strategy C	Strategy D
Salisbury-Basingstoke (car)	44	43	43	43	44
Salisbury-Basingstoke (rail)	70	70	73	66	66

Frequency and capacity of rail services - @ 2016

	Do Minimum	Strategy A	Strategy B	Strategy C	Strategy D
Trains/hour					
Plymouth-Bristol	1.1	1.1	1.1	1.1	1.1
Taunton-Reading	1.1	1.1	1.1	1.1	1.1
Salisbury-Basingstoke	2.0	2.0	2.0	3.0	3.0
Seats/hour					
Plymouth-Bristol	271	271	271	271	271
Taunton-Reading	502	502	502	502	502
Salisbury-Basingstoke	392	392	392	588	588

Comment : There is relatively little difference for the journey times between different locations by strategy, although all strategies perform at least as well as the Do Minimum. Strategies C and D provide a higher frequency and seating capacity on rail services compared to the other strategies.

- (4) *To reduce the peripherality of Devon and Cornwall*

Table 3.4 : Reducing peripherality

Journey times (road and rail) – minutes @ 2016

	Do Minimum	Strategy A	Strategy B	Strategy C	Strategy D
Exeter-London (car)	199	190	192	181	191
Exeter-London (rail)	184	184	187	175	175
Exeter-Bristol (car)	86	83	84	83	85
Exeter-Bristol (rail)	89	89	89	89	89
Penzance-Exeter (car)	112	111	111	106	106
Penzance-Exeter (rail)	204	204	204	192	192

Frequency and capacity of rail services - @ 2016

	Do Minimum	Strategy A	Strategy B	Strategy C	Strategy D
Trains/hour					
Exeter-London	2.1	2.1	2.1	2.8	2.8

	Do Minimum	Strategy A	Strategy B	Strategy C	Strategy D
Exeter-Bristol	2.3	2.3	2.3	2.3	2.3
Penzance-Exeter	0.5	0.5	0.5	0.5	0.5
Seats/hour					
Exeter-London	588	588	588	725	725
Exeter-Bristol	555	555	555	555	555
Penzance-Exeter	228	228	228	228	228

Comment : Car journey times between Exeter and London are reduced most with Strategy C, although other journey times again show modest reductions compared to the Do Minimum. Again it is Strategies C and D which perform best in terms of frequency and seating capacity, this time on the Exeter-London service.

- (5) *To reduce congestion at key locations on the road network*

Table 3.5 : Reducing road congestion

Number of links over capacity - @ 2016 average hour

	Do Minimum	Strategy A	Strategy B	Strategy C	Strategy D
1 way links v/c >0.8	248	193	192	193	243

Operating conditions at key locations (v/c) - @ 2016 average hour

	Do Minimum	Strategy A	Strategy B	Strategy C	Strategy D
M4/M5 around Bristol					
M4 Jcn 19-Jcn20	1.00	0.87	0.89	0.62	0.67
M4 Jcn 19-Jcn18	0.50	0.41	0.44	0.33	0.37
M5 Jcn 20-Jcn19	0.56	0.47	0.53	0.38	0.42
M5 Jcn 19-Jcn18a	0.39	0.33	0.36	0.28	0.32
M5 Jcn 18a-Jcn17	0.49	0.41	0.42	0.33	0.35
M4 Swindon					
Jcn 16-Jcn 15	0.46	0.38	0.42	0.41	0.44
Jcn 15-Jcn 14	0.46	0.38	0.43	0.32	0.35
M4 Reading					
Jcn 10-Jcn8/9	0.70	0.59	0.67	0.65	0.69
Jcn 7 – Jcn 6	0.80	0.63	0.71	0.65	0.69
Jcn 8/9- Jcn 7	0.80	0.67	0.77	0.70	0.70
Jcn 6 –Jcn 5	0.99	0.74	0.82	0.76	0.78
A303					
Bishopwood	0.30	0.28	0.27	0.16	0.32
Ilminster bypass	0.64	0.58	0.58	0.41	0.66
Mere bypass	0.25	0.23	0.21	0.26	0.27

	Do Minimum	Strategy A	Strategy B	Strategy C	Strategy D
Chicklade	0.58	0.53	0.49	0.25	0.26
E. of Longbarrow	0.29	0.26	0.24	0.26	0.28
E. of Countess	0.35	0.31	0.29	0.31	0.34
Thrupton	0.34	0.31	0.29	0.31	0.33
Andover, A3048-A34	0.52	0.46	0.45	0.46	0.49
Micheldever	0.46	0.41	0.40	0.41	0.42
M3					
Jcn 9 – Jcn 8	0.55	0.51	0.52	0.51	0.54
Jcn 8 – Jcn 7	0.61	0.57	0.57	0.57	0.59
Jcn 7 – Jcn 6	0.55	0.47	0.49	0.47	0.47
Jcn 6 – Jcn 5	0.64	0.61	0.59	0.60	0.66
Jcn 5 – Jcn 4a	0.55	0.51	0.49	0.50	0.55
Jcn 4a - Jcn 4	0.75	0.67	0.66	0.65	0.73
Jcn 4 – Jcn 3	0.75	0.65	0.68	0.66	0.68
M5					
Jcn 20-21	0.56	0.47	0.53	0.38	0.42
Jcn 21-22	0.57	0.49	0.54	0.39	0.44
A358					
M5-A378	0.70	0.62	0.61	0.61	0.65
A378-A303	0.48	0.42	0.43	0.52	0.47

Comment : Overall, Strategy C provides the largest reductions in congestion at the key locations, this being particularly evident on the M4/M5 around Bristol, the A303 and the M5 around Taunton. Strategy D also performs well around Bristol. Elsewhere there is little to choose between the different strategies, although all tend to perform better than the Do Minimum.

- (6) *To reduce congestion at key locations on the rail network*

Table 3.6 : Reducing rail congestion

Number of overcrowded trains

Volume/Seat Capacity	Do Minimum	Strategy A	Strategy B	Strategy C	Strategy D
Bath-Swindon	0.59	0.57	0.56	0.46	0.53
Swindon –Bristol P'way	0.45	0.45	0.45	0.47	0.47
Westbury-Newbury	0.75	0.79	0.57	0.56	0.58
Bath-Bristol	0.55	0.55	0.44	0.40	0.51
Westbury-Frome	0.52	0.56	0.52	0.55	0.57
Weston-S-M – Bristol	0.32	0.32	0.29	0.22	0.31
Weston-S-M – Taunton	0.29	0.28	0.28	0.18	0.23

Volume/Seat Capacity	Do Minimum	Strategy A	Strategy B	Strategy C	Strategy D
Swindon-Didcot	0.59	0.57	0.56	0.51	0.52
Exeter-Taunton	0.35	0.33	0.32	0.28	0.29
Crewkerne-Axminster	0.27	0.21	0.22	0.1	0.11
Reading-Twyford	0.9	0.92	0.89	0.88	0.86
Maidenhead-Slough	1.03	1.03	1.02	0.99	1.05
Farnb'h-Basingstoke	0.84	0.81	0.81	0.67	0.7
Newbury-Reading	0.65	0.62	0.62	0.68	0.71
Salisbury-Basingstoke	0.56	0.52	0.52	0.38	0.4
Salisbury-Gillingham	0.47	0.45	0.43	0.26	0.26
Exeter-Plymouth	0.36	0.33	0.32	0.23	0.25
Saltash-Plymouth	0.51	0.51	0.52	0.41	0.44

Comment : Again it is Strategy C which tends to perform best in reducing the number of overcrowded trains, followed by Strategy D. Strategies A and B tend to be little different from the Do Minimum.

(7) *To reduce seasonal congestion at key locations on the road network*

Table 3.7 : Reducing Seasonal Congestion

Operating conditions at key locations (v/c) - @ 2016 average August hour.

	Do Minimum	Strategy A	Strategy B	Strategy C	Strategy D
A30/A303					
Honiton bypass	0.27	0.25	0.25	0.27	0.27
Bishopswood	0.42	0.39	0.37	0.22	0.44
Ilminster bypass	0.88	0.79	0.80	0.56	0.91
Mere bypass	0.34	0.31	0.29	0.35	0.37
Chicklade	0.80	0.73	0.68	0.34	0.36
E of Longbarrow	0.39	0.35	0.33	0.35	0.38
E of Countess	0.48	0.43	0.40	0.43	0.47
Thrupton	0.47	0.42	0.40	0.42	0.45
Andover, A3048-A34	0.71	0.65	0.62	0.64	0.66
Micheldever	0.64	0.58	0.55	0.57	0.57
M5					
M5 J31-30	0.59	0.48	0.50	0.50	0.58
J30-29	0.69	0.49	0.61	0.51	0.50
A38					
Stoketon Cross	0.70	0.63	0.64	0.29	0.31
Halfway House	0.35	0.31	0.32	0.32	0.35
Dobwalls	0.20	0.18	0.18	0.18	0.21

	Do Minimum	Strategy A	Strategy B	Strategy C	Strategy D
A30					
Tolgus	0.28	0.25	0.26	0.26	0.28
Blackwater bypass	0.46	0.40	0.41	0.41	0.46
Marazanvose	0.25	0.22	0.23	0.12	0.13
Mount Pleasant	0.24	0.22	0.22	0.22	0.24
N of Bodmin	0.61	0.53	0.55	0.23	0.26
Launceston bypass	0.28	0.25	0.25	0.25	0.28
E of Launceston	0.26	0.21	0.20	0.20	0.26
Okehampton bypass	0.39	0.31	0.30	0.30	0.39
Tedbury St Martin	0.36	0.30	0.28	0.28	0.35

Operating conditions at key locations (v/c) - @ 2016 August Saturday hour

	Do Minimum	Strategy A	Strategy B	Strategy C	Strategy D
A30/A303					
Honiton bypass	0.51	0.47	0.46	0.50	0.50
Bishopswood	0.77	0.72	0.69	0.41	0.82
Iminster bypass	1.64	1.47	1.49	1.04	1.69
Mere bypass	0.64	0.58	0.54	0.65	0.68
Chicklade	1.49	1.35	1.26	0.64	0.66
E of Longbarrow	0.73	0.66	0.61	0.65	0.70
E of Countess	0.89	0.79	0.75	0.79	0.86
Thrupton	0.87	0.79	0.75	0.79	0.84
Andover, A3048-A34	1.32	1.20	1.16	1.19	1.23
Micheldever	1.18	1.08	1.03	1.05	1.05
M5					
M5 J31-30	1.17	0.95	1.00	0.99	1.15
J30-29	1.38	0.97	1.21	1.01	1.00
A38					
Stoketon Cross	0.66	0.59	0.61	0.27	0.30
Halfway House	0.33	0.29	0.30	0.30	0.33
Dobwalls	0.19	0.17	0.17	0.17	0.19
A30					
Tolgus	0.61	0.54	0.55	0.55	0.61
Blackwater bypass	0.98	0.87	0.89	0.89	0.98
Marazanvose	0.54	0.48	0.49	0.26	0.28
Mount Pleasant	0.52	0.46	0.47	0.47	0.52
N of Bodmin	1.30	1.15	1.18	0.50	0.56
Launceston bypass	0.61	0.54	0.55	0.55	0.60
E of Launceston	0.56	0.46	0.44	0.44	0.56
Okehampton bypass	0.81	0.65	0.61	0.61	0.79
Tedbury St Martin	0.57	0.47	0.44	0.44	0.55

Comment : Whilst Strategy C again tends to provide greatest benefit to the average August hour, the v/c ratios are comparatively modest in most locations. As expected, however, the position becomes more acute for an August Saturday. Whilst Strategy C provides the best operating conditions, there are still some sections of A30/A303 and M5 which are forecast to be overcapacity.

3.5 ***Results of the Appraisal – Supporting Analyses***

Distribution and Equity

3.5.1 To quote from GOMMMS, “This supporting analysis is designed to show the distribution of the overall impacts summarised in the AST, thereby enabling a judgement to be made about the fairness of the impacts across those affected by the strategy or plan” (paragraph 6.5.3, Volume 1). However, as evident from the previous section, the selection of the Additional Appraisal Criteria has also addressed some key issues of impact distribution.

3.5.2 The issue which merits greater discussion, however, is social inclusion since the impacts upon different parts of society are subsumed within the other impacts. This is discussed below.

3.5.3 **Common to all strategies:** All strategies provide significant benefit to public transport users, whether they be users of public transport by choice or those without a car available for their journey. This is evident in the measures put forward to improve integration, security, transport interchange and access to the transport system. Such improvements will provide particular benefits for those who are reliant on public transport for their journeys.

3.5.4 **Strategy A:** These measures are evident in Strategy A, providing benefits for those living in both urban and rural areas.

3.5.5 **Strategy B:** Strategy B provides additional benefits for those living within or travelling to and from the Principal Urban Areas. This is again particularly beneficial for public transport users.

3.5.6 **Strategy C:** Strategy C provides less benefits to the Principal Urban Areas than Strategy B, but more by way of improvements along the main transport corridors. This gives benefit to those who are able to access the new facilities being provided, which tends to be either the car-borne rural dweller or those who live close enough to the new facilities to walk, cycle or use connecting public transport services.

3.5.7 **Strategy D:** Strategy D is very similar to Strategy C in respect of its impact upon the socially excluded.

Affordability and Financial Sustainability

3.5.8 As part of the overall appraisal of transport strategies, it is recommended within GOMMMS that an analysis is carried out of their forecast financial performance. This involves identifying the streams of costs and revenue that would result from adopting the strategy and allocating these costs and revenue to a transport market sector. In particular, it is intended that public sector expenditure and revenue is separately identified from the private sector expenditure and revenue.

3.5.9 This section describes the approach which has been adopted and the results of the analysis. All of the values quoted are at Year 2000 prices.

3.5.10 For this study, we have taken account of seven main items of cost and revenue:

- Capital costs associated with new highway infrastructure;
- Capital costs associated with new rail infrastructure;
- Capital costs associated with other measures;
- Running costs associated with the operation of additional rail services;
- Running costs associated with other measures;
- Additional rail farebox revenue associated with rail schemes – infrastructure works and operation of additional services; and
- Public sector revenue from fiscal traffic restraint measures – parking, congestion charging tolling etc.

3.5.11 At this stage, due to the uncertainties regarding the financial requirements of the ‘other measures’ a single financial sum has been set aside to cover both the capital and running costs.

3.5.12 At this stage of development there is significant uncertainty regarding both the capital and running costs associated with each of the composite strategies. Furthermore, the funding mechanisms to be used to implement the findings of the multi modal studies and hence the contributions to be made by the public and private sectors are unclear at present. Particular uncertainties are associated with the following issues:

- Funding of rail infrastructure works – the role of the SRA, Railtrack, TOCs and the potential need for special financial vehicles;

- The extent to which rail infrastructure works will be paid for via the franchising process and hence capital costs will be paid for through subsidies/grants to TOCs;
- The extent to which the growth in rail farebox revenue over the coming years will generate sufficient income for the TOCs to cover the additional operating costs of new services and other investments;
- The outcome of the on-going review of freight grants being undertaken by the SRA;
- The extent to which the proposed freight facilities would be commercially viable without substantial grant aid; and
- The source of funding for the wide range on non-infrastructure measures.

3.5.13

For the purposes of appraising the composite strategies we have chosen to exclude those elements of cost, which we consider would be primarily funded through the Local Transport Plan process, in order that there is no double counting of costs. This has a particular impact on Strategy B for which many of the costs might be considered to fall within the scope of Local Transport Plans.

3.5.14

There are a number of other cost elements that have not been explicitly taken into account to date due to some of the uncertainties described above. It is anticipated that the following elements will be considered in due course:

- Running costs associated with the operation of new bus and coach services;
- Additional revenue associated with additional bus and coach passengers;
- Costs associated with enhancing ports and airports, and access to these facilities; and
- Capital costs of creating new freight facilities and operating costs associated with running additional freight services.

3.5.15

Due to the uncertainties regarding costing and funding which have been described in the previous section, we have therefore made a number of simplifying assumptions in appraising the Composite Strategies. The key ones are as follows:

- Highway capital scheme costs are all incurred directly by government and occur over the period 2001 – 2006;
- The effects of the strategies on highway maintenance and rail maintenance costs have been excluded;
- Rail capital scheme costs are assumed to be incurred by the private sector but covered by 100% grant from government;

- Rail capital schemes costs are assumed to be incurred over the period 2001 – 2006, although it is recognised that in practice a number of schemes may not be complete by 2006 ;
- Additional rail operating costs are assumed to be incurred by the private sector on an annual basis from 2006 – 2035; and
- For ‘other measures’ it has been assumed that the costs are incurred in the period 2001 – 2006, although it is recognised that in practice some of the costs might be incurred as running costs spreading over the full 30 year appraisal period.

3.5.16

It should be noted that all costs are considered relative to the Do Minimum situation; therefore the costs of all schemes and measures which are within the Do Minimum have not been included.

The following tables set out the assumed costs for each of the four composite strategies:

Strategy A

Element	*Cost/ (Revenue) £M	Years Incurred	Source
Highway Capital costs	7	2001-2006	Public sector – direct
Rail Capital costs	4	2001-2006	Private sector – 100% grant aided by government
Other measures costs	341	2001-2006	Public sector – direct
Rail Operating Costs	0	2006-2035	Private sector
Rail Farebox Revenue	+	2006-2035	Private sector
Revenue from fiscal traffic restraint measures**	(870) per annum - typical	2006-2035	Public sector

* Relative to Do Minimum situation

+ Omitted pending further analysis of rail overcrowding and reliability

** Elements of this revenue relate to measures which will be funded through the Local Transport Plan process and is therefore not directly comparable with other items.

Strategy B

Element	*Cost/ (Revenue) £M	Years Incurred	Source
Highway Capital costs	12	2001-2006	Public sector – direct
Rail Capital costs	15	2001-2006	Private sector – 100% grant aided by government
Other measures costs	105	2001-2006	Public sector – direct
Rail Operating Costs	60 per annum	2006-2035	Private sector
Rail Farebox Revenue	+	2006-2035	Private sector
Revenue from fiscal traffic restraint measures**	(676) per annum – typical	2006-2035	Public sector

- * Relative to Do Minimum situation
- + Omitted pending further analysis of rail overcrowding and reliability
- ** Elements of this revenue relate to measures which will funded through the Local Transport Plan process and is therefore not directly comparable with other items.

Strategy C

Element	*Cost/ (Revenue) £M	Years Incurred	Source
Highway Capital costs	234	2001-2006	Public sector – direct
Rail Capital costs	1988	2001-2006	Private sector – 100% grant aided by government
Other measures costs	241	2001-2006	Public sector – direct
Rail Operating Costs	176 per annum	2006-2035	Private sector
Rail Farebox Revenue	+	2006-2035	Private sector
Revenue from fiscal traffic restraint measures	0	2006-2035	Public sector

- * Relative to Do Minimum situation
- + Omitted pending further analysis of rail overcrowding and reliability
- ** Elements of this revenue relate to measures which will funded through the Local Transport Plan process and is therefore not directly comparable with other items.

Strategy D

Element	*Cost/ (Revenue) £M	Years Incurred	Source
Highway Capital costs	507	2001-2006	Public sector – direct
Rail Capital costs	1988	2001-2006	Private sector – 100% grant aided by government
Other measures costs	191	2001-2006	Public sector – direct
Rail Operating Costs	176 per annum	2006-2035	Private sector
Rail Farebox Revenue	+	2006-2035	Private sector
Revenue from fiscal traffic restraint measures	(765) per annum – typical	2006-2035	Public sector

* Relative to Do Minimum situation

+ Omitted pending further analysis of rail overcrowding and reliability

** Elements of this revenue relate to measures which will be funded through the Local Transport Plan process and is therefore not directly comparable with other items.

3.5.17

Overall the following conclusions can be drawn regarding the affordability and financial sustainability of the composite strategies:

- The estimated cost to Government ranges from £132M for Strategy B to £2686M for Strategy D. Much of this expenditure would fall within the first five years of the Strategy being in place;
- These costs are over and above those costs which would be incurred implementing the schemes and measures incorporated within the Do Minimum;
- Up to £176M per annum will be required from the rail industry to operate the additional rail services. The requirements are greatest for strategies C and D; and
- The potential income to Government/Public Sector from fiscal traffic restraint measures is very large, although the proportion which might be allocated (hypothecated) to measures associated with this approach is questionable.

Practicality and Public Acceptability

- 3.5.18 This supporting analysis is intended to provide an overall assessment of the practicality and public acceptability of each strategy. Each composite approach is commented on as follows.
- 3.5.19 **Strategy A:** Although many stakeholders have argued for emphasis to be placed upon lower infrastructure spend and more 'sustainable' transport provision, the majority of stakeholders clearly expect any final Strategy to include significant investment in new transport schemes. Whilst some would no doubt accept Strategy A if it could be shown to meet the area's problems and issues to sufficient degree, most would be sceptical of a strategy which placed such an importance on reducing the demand for travel. Indeed, there is a fear that it would be perceived as anti-motorist and would fail to achieve public acceptability.
- 3.5.20 **Strategy B:** Strategy B places greatest emphasis on supporting the work of Local Authorities, particularly within the Principal Urban Areas, to achieve a mode switch to the more sustainable modes of transport. Whilst the mechanism for much of this work is now established through Local Transport Plans, it will need close cooperation between local authorities and other transport bodies if a strategy which benefits both the local areas and the main transport corridors is to be successfully implemented. Moreover, since Strategy B excludes significant spend on the main transport corridors themselves, it is still unlikely to find favour with those who argue for specific spend on those corridors to address the main problems and issues.
- 3.5.21 **Strategy C:** In contrast, Strategy C includes such expenditure. However, by including such schemes, particularly highway schemes, it contains elements within the strategy which are unlikely to be acceptable to some stakeholders. By including such schemes, it also increases the risk of public inquiries either delaying or, at worst, undermining the strategy. A further risk within this strategy is that it places a large burden on the rail industry to deliver a very comprehensive programme of investment at a time when there are competing demands throughout the UK for similar resources. On the positive side, however, the strategy would in all probability be regarded by the majority of stakeholders as reasonably well balanced in that it includes both the reduced demand for travel and significant investment.
- 3.5.22 **Strategy D:** Strategy D would be perceived by many as an extension of previous policies, having similarities with 'predict and provide'. Making no allowance for reducing the need to travel, it is unlikely to find favour with the majority of

stakeholders. Moreover, it would probably experience even greater problems in implementing the highway elements of the strategy than Strategy C, with a larger number of possible public inquiries. Of all four strategies, Strategy D is also the most expensive, placing yet more burden on the transport industry to deliver a very intensive programme of investment.

3.6

Summary of Key Findings

3.6.1

There are several key findings to emerge from the GOMMMS appraisal of the four Composite Strategies. These are described below.

Reducing the Need to Travel

3.6.2

It is clear from the appraisal, together with further interrogation of the transport model results, that reducing the growth in travel demand must form a core element of any Emerging Strategy. It is equally clear, however, that reducing this growth, even when combined with greater integration and limited spend on new infrastructure (Strategy A), will not be sufficient to address all the problems and issues.

3.6.3

Whilst reduced levels of travel demand will also lead to reduced rail patronage (5% reduction for Strategy A compared to the Do Minimum), it is in terms of highway flows that the greatest benefit is obtained (16% reduction in vehicle kilometres, reflecting a 'multiplier effect' benefit of reducing overall travel demand). This provides particular benefits in terms of local air quality, savings in accidents and reduced congestion.

3.6.4

The relative performance of Strategy D should also be noted in this respect. That is, despite its large investment focussed on particular problem locations, Strategy D has almost the same number of over-capacity highway links within the whole SWARMMS area as the Do Minimum.

Integration

3.6.5

The GOMMMS appraisal reinforces the need for high quality integration to be a priority within the Emerging Strategy. In its various forms, it provides a direct benefit to such sub-objectives as security, transport interchange, land use policy, other government policies, option values and access to the transport system.

3.6.6

Its indirect effects, however, are equally important. In particular, the analysis shows the extent to which the travelling public's view of travel by public transport

(particularly rail, due to the nature and extent of the SWARMMS study area) is an important determinant of modal share, the impact of which is reflected throughout the appraisal.

Local Action

3.6.7 Strategy B provides some noticeable benefits over and above Strategy A. It is also clear from the appraisal, however, that action at the local level will not be sufficient to address many key problems and issues within the study area.

3.6.8 It follows from the above that there is a need for the Emerging Strategy to also include some significant investment along the main transport corridors themselves. As evident from the appraisal, however, it is the items of major new infrastructure that tend to exhibit both disbenefit and benefit. The selection of the Emerging Strategy, therefore, is a complex and difficult task.

Appraisal Summary Table

Figure 3.1

Option: Strategy A		Description: New Infrastructure Minimisation	Problems	Present Value Cost To Government £220M
OBJECTIVE	SUB-OBJECTIVE	QUALITATIVE IMPACTS	QUANTITATIVE MEASURE	ASSESSMENT
ENVIRONMENT	Noise	In 15 th year 8 zones 'losers', 63 zones 'winners', 1 zone 'no change', Indicates benefit spread across region. Zonal 'winners' generally associated with traffic reductions, zonal 'losers' generally associated with traffic increases. Net impact results from distribution of population between zones.	Change in estimated population annoyed in 15 th year with Strategy compared with present Do-Minimum: +2348 people	Net change in estimated population annoyed in 15 th year with Strategy compared with future Do Minimum -1828 people
	Local Air Quality	8 of the winning districts have air quality problems (AQMA), and thus the benefit at these locations is more than suggested by the AST. This applies to Nitrogen Dioxide and PM ₁₀ .	NO2: 71 zones winners NO2: 1 zone no change PM10: 71 zones winners PM10: 1 zone no change	Emissions Estimate NO2: -5,527,545 Emissions Estimate PM10: -149,022
	Greenhouse Gases	Includes both road and rail emissions.		Reduction of 1,812,610 tonnes of CO2 per year (-10%)
	Landscape	Although there would be landscape impacts associated with the measures within the strategy, it was felt that they are local and would not be significant.		Insignificant Impact
	Townscape	Although the impacts are insignificant, the traffic management measures are likely in some instances to create local townscape impact.		Insignificant Impact
	Heritage of Historic Resources	Potential impacts are minimal and localised. In some instances, the impact is uncertain.		Insignificant Impact
	Biodiversity	All of the measures have an insignificant impact. There are potential localised impacts associated with station developments and traffic management proposals but overall the measures have insignificant impact.		Insignificant Impact
	Water Environment	Reduced road traffic movement may lower pollutant loading on road surfaces and lower accident risk - leading to positive impact on water environment. Any changes are unlikely to be significant at the strategic level.		Insignificant Impact
	Physical Fitness	Aims to greatly reduce growth of traffic and improve public transport which could either increase or decrease physical fitness depending on the activities which are substituted for car travel and replaced by public transport usage. If cycling, walking or other physical activity increases this could be positive but the effect of Strategy A on 'Physical Fitness' remains unclear.		Uncertain Impact
	Journey Ambience	Reduced traffic growth, and significantly improved integration of transport would improve public transport and therefore 'Traveller Care'. Also, use of next generation technology, is likely to improve all forms of travel, making it less stressful. Overall Strategy A leads to an improvement in journey ambience.		Slight Beneficial Impact
SAFETY	Accidents	Significant accident savings associated with reduced highway travel demand.	Savings: Fatal: 371 Serious: 2,392 Slight: 28,998	PVB £566M
	Security	The provision of help points and CCTV at unstaffed interchanges and improved lighting will help to improve personal security.		Moderate Beneficial Impact
ECONOMY	Transport Economic Efficiency	Excludes impact of additional rail passenger fare revenue and potential public sector income arising from fiscal traffic restraint measures.		Users: NPV £23,953M Private providers: NPV £0M Public providers: NPV -£217M Other Government: NPV- £8251M
	Reliability	Demand management and proposals to encourage a mode shift from car to public transport would reduce the trips on the strategic highway network and improve journey time reliability. No major improvement in rail track infrastructure to increase rail reliability.		Slight Beneficial Impact
	Wider Economic Impacts	Does little to enhance the strategic rail and road links between the regeneration zones within the Study area (Cornwall and parts of Devon) and the rest of the country. As a result, it is anticipated that this Strategy will have little impact on peripherality		Neutral Impact
ACCESSIBILITY	Option Values	Two new rail stations provide strong beneficial effects, but only at local level. Enhancements to bus/coach services and public transport access to rail stations will include limited new options.		Neutral Impact
	Severance	Strategy A does not include the provision of strategic new highway infrastructure; therefore the assessment of this strategy is essentially that of the Do Minimum situation.		Neutral Impact
	Access to the Transport System	Major effects associated with introduction of demand responsive public transport services.	Do Min Access Index: 74.7 Strat A Access Index: 82.5	Moderate Beneficial Impact
INTEGRATION	Transport Interchange	The upgrading of existing interchanges, improved information for all travellers, coach network upgrades and Park and Ride measures will provide a moderate impact.		Moderate Beneficial Impact
	Land-Use Policy	Performs well against Local Transport Plans, but less so against Structure Plan policies. Performs poorly against Regional policy, but well against national policy, particularly in respect of town centres.		Neutral Impact
	Other Government Policies	Generally is not consistent with other Government policies owing to focus on minimising the provision of enabling infrastructure – implications for neighbourhood renewal, competitiveness, tourism, access to work, and air quality.		Adverse Impact

Appraisal Summary Table

Figure 3.2

Option: Strategy B		Description: Local Focus	Problems	Present Value Cost To Government £55M
OBJECTIVE	SUB-OBJECTIVE	QUALITATIVE IMPACTS	QUANTITATIVE MEASURE	ASSESSMENT
ENVIRONMENT	Noise	In 15 th year 19 zones 'losers', 52 zones 'winners'. Indicates disbenefits area limited to a small number of zones. Zonal 'winners' generally associated with traffic reductions, zonal 'losers' associated with traffic increases and increased levels of rail services. Net impact results from distribution of population between zones.	Change in estimated population annoyed in 15 th year with Strategy compared with present Do-Minimum: +6759 people	Change in estimated population annoyed in 15 th year with Strategy compared with future Do-Minimum: Net +1594 people
	Local Air Quality	For Nitrogen Dioxide, 7 of the winning districts, but 1 of the losing districts, have air quality problems (AQMA). Thus the benefit of the strategy is more than suggested by the AST. For PM ₁₀ , 6 of the winning districts, but 2 of the losing districts, have air quality problems (AQMA). Thus the benefit of the strategy is more than suggested by the AST.	NO2: 66 zones winners NO2: 5 zones losers NO2: 1 zone no change PM10: 66 zones winners PM10: 5 zones losers PM10: 1 zone no change	Emission Estimate NO2: -12,263,491 Emission Estimate PM10: -490,241
	Greenhouse Gases	Includes both road and rail emissions.		Reduction of 1,633,906 tonnes of CO2 per year (-9%)
	Landscape	The mixture of bypasses, local schemes and new rail stations result in a mix of insignificant and negative landscape impacts.		Negative Impact
	Townscape	The majority of schemes within this strategy are either within a rural environment or on the urban fringe. Therefore, the vast majority of schemes have an insignificant impact on townscape.		Insignificant Impact
	Heritage of Historic Resources	As the majority of these schemes are local, the impact on heritage is uncertain, applying the precautionary principle.		Uncertain Impact
	Biodiversity	Most strategy measures are expected to have an insignificant impact upon biodiversity. A limited number of 'probable negative' impacts are possible associated with new stations and highway measures.		Insignificant Impact
	Water Environment	Rail service alterations and station development have minimal impact on the water environment. New road developments will have a local negative impact on the water environment, although in most cases this is readily mitigated and the overall impact is insignificant.		Insignificant Impact
	Physical Fitness	Aims to reduce growth of traffic and increase public transport usage which could either increase or decrease physical fitness depending on the activities which are substituted for car travel and replaced by public transport usage. If cycling, walking or other physical activity increases this could be positive but the effect of Strategy B on 'Physical Fitness' remains unclear.		Uncertain Impact
	Journey Ambience	'Traveller Care' will improve through public transport improvements and local measures. Journey ambience is expected to be better overall.		Moderate Beneficial Impact
SAFETY	Accidents	Significant accident savings associated with reduced highway travel demand.	Savings: Fatal: 315 Serious: 2,055 Slight: 23,721	PVB £476M
	Security	The provision of help points and CCTV in unstaffed interchanges and improved lighting will help to improve personal security.		Moderate Beneficial Impact
ECONOMY	Transport Economic Efficiency	Excludes impact of additional rail passenger fare revenue and potential public sector income arising from fiscal traffic restraint measures.		Users: NPV £22,891M Private providers: NPV £-529M Public providers: NPV £-45M Other Government: NPV £-6993M
	Reliability	Proposals to encourage a mode shift from car to public transport would reduce the trips on the strategic highway network and, hence, improve journey time reliability. Proposals for new rail services and increases in track/signalling capacity, which would improve reliability are restricted to local network.		Slight Beneficial Impact
	Wider Economic Impacts	Does little to enhance the strategic rail and road links between the regeneration zones within the Study area (Cornwall and parts of Devon) and the rest of the country. As a result, it is anticipated that this Strategy will have little impact on periphery.		Neutral Impact
ACCESSIBILITY	Option Values	Ten new rail stations provide strong beneficial effects at the local level for each station, and combined will provide overall study area wide opportunities. Enhancements to bus/coach services and public transport access to rail stations will include limited new options.		Moderate Beneficial Impact
	Severance	Does not include the provision of strategic new highway infrastructure; therefore the assessment of this strategy is essentially that of the Do Minimum situation.		Neutral Impact
	Access to the Transport System	Major effects associated with introduction of demand responsive public transport feeder services and the improvement of local public transport services, interchanges and facilities.	Do Min Access Index: 74.7 Strategy B Access Index: 100	Large Beneficial Impact
INTEGRATION	Transport Interchange	The upgrading of existing interchanges, improved information for all travellers, coach network upgrades and Park and Ride measures will provide a moderate impact.		Moderate Beneficial Impact
	Land-Use Policy	General compliance (at least in part) with the principles set out at the national level as part of planning policy guidance, but in some cases does not meet the objectives and policies at the regional level, particularly those that are area-based. Performance of Strategy B is improved over Strategy A in this respect.		Positive Impact
	Other Government Policies	Consistent with some other Government policies relating to local regeneration, access to employment and the protection of agricultural assets. Less consistent with policy aimed at supporting tourism, regional competitiveness and improving overall air quality.		Neutral Impact

Appraisal Summary Table

Figure 3.3

Option: Strategy C		Description: Strategic Focus	Problems	Present Value Cost To Government £1613M
OBJECTIVE	SUB-OBJECTIVE	QUALITATIVE IMPACTS	QUANTITATIVE MEASURE	ASSESSMENT
ENVIRONMENT	Noise	In 15th year 38 zones 'winners', 34 zones 'losers'. Zonal 'winners' – generally associated with traffic reductions, zonal 'losers' - some associated with traffic increases and most associated with increased levels of rail services. Benefits and disbenefits are spread across the Study Area. Net impact results from distribution of population between zones.	Change in estimated population annoyed in 15 th year with Strategy compared with present Do-Minimum: +7117 people	Net 'change in estimated population annoyed in 15 th year with Strategy compared with the future Do Minimum : +9141 people
	Local Air Quality	For Nitrogen Dioxide, 6 of the winning districts, but 2 of the losing districts, have air quality problems (AQMA). Thus benefits from the strategy are more than suggested by the AST. For PM10, 7 of the winning districts, but 1 of the losing districts, have air quality problems (AQMA). Thus benefits from the strategy are more than suggested by the AST.	NO2: 51 zones 'winners' NO2: 21 zones 'losers' NO2: 1 zone no change PM10: 54 zones 'winners' PM10: 17 zones 'losers' PM10: 1 zone no change	Emissions Estimate NO2: -7,884,283 Emissions Estimate PM10: -188,028
	Greenhouse Gases	Includes both road and rail emissions.		Reduction of 1,195,011 tonnes of CO2 per year (-6%)
	Landscape	Due to the provision of significant new road infrastructure, approximately half of the schemes have a negative impact on the landscape. Additionally, some of the schemes directly and indirectly affect nationally designated landscapes.		Negative Impact
	Townscape	Due to the strategic nature of the roads, the schemes substantially complete the dualling of the routes. The resulting impacts on townscape are mainly insignificant as most of the settlements along the corridors are bypassed. However, there are some direct impacts on some settlements, associated with the A303/A30 improvements.		Insignificant Impact
	Heritage of Historic Resources	Due to the extent and nature of the road schemes in this strategy, the potential impact on heritage is wide reaching. However, the specific location of these heritage features in relation to the schemes is uncertain, at this stage of strategy development.		Uncertain Impact
	Biodiversity	Although the schemes might have some local impacts on biodiversity, they do not cross nationally or internationally designated sites. Furthermore with the potential for mitigation, the impacts are considered not to be significant.		Insignificant Impact
	Water Environment	With the greater development of new road and rail infrastructure, there is an increased likelihood of impacts on the water environment. However, overall impacts generally remain localised and with, in many cases, the opportunity for mitigation.		Insignificant Impact
	Physical Fitness	Aims to reduce growth of traffic and substantially improve public transport services which could either increase or decrease physical fitness depending on the activities which are substituted for car travel and replaced by public transport usage. If cycling, walking or other physical activity increases this could be positive but the effect of Strategy C on 'Physical Fitness' remains unclear.		Uncertain Impact
SAFETY	Journey Ambience	Some improvements to journey ambience associated with reduced growth in travel demand and improved integration. Significant improvements associated with new and improved public transport services which will improve 'traveller care'. New roads and traffic management will also reduce traveller stress as will freight measures to reduce HGV volumes.		Significant Beneficial Impact
	Accidents	Significant accident savings associated with reduced highway demand and new highway infrastructure.	Savings: Fatal: 419 Serious: 2,568 Slight: 25,986	PVB £575M
ECONOMY	Security	The provision of help points and CCTV in unstaffed interchanges and improved lighting will help to improve personal security.		Moderate Beneficial Impact
	Transport Economic Efficiency	Excludes impact of additional rail passenger fare revenue and potential public sector income arising from fiscal traffic restraint measures.		Users: NPV £23,309M Private providers: NPV £-1724M Public providers: NPV £-312M Other Government: NPV £-8195M
	Reliability	Improvements to the strategic highway network, demand management proposals, measures to encourage a mode shift from highway modes car to public transport would enhance capacity and thus improving journey time reliability. Proposals for new rail services and stations, matched by significant increases in track/signalling capacity, would increase reliability.		Moderate Beneficial Impact
ACCESSIBILITY	Wider Economic Impacts	Enhances the strategic rail and road links between the regeneration zones within the Study area (Cornwall and parts of Devon) and the rest of the country, which assists with overcoming peripherality.		Positive Impacts
	Option Values	Three new rail stations provide strong beneficial effects at local level. Enhancements to rail station public transport access and coach services will include limited new options.		Slight Beneficial Impact
	Severance	Offers relief to a range of communities along the A303/A30 as a result of highway schemes. These benefits are seen to outweigh the slightly negative effects derived from dualling a number of other sections; thus a moderately positive result.		Moderate Positive Impact
INTEGRATION	Access to the Transport System	Major effects associated with introduction of demand responsive public transport feeder services.	Do Min Access Index: 74.7 Strategy C Access Index: 84.1	Moderate Beneficial Impact
	Transport Interchange	The upgrading of existing interchanges, improved information for all travellers, coach network upgrades and Park and Ride measures will provide a moderate beneficial impact.		Moderate Beneficial Impact
	Land-Use Policy	Performs well against local, regional and national policies. Has least incidence of non-compliance.		Positive Impact
	Other Government Policies	Consistent with other Government policies relating to protection of agricultural assets, air quality, access to employment, regional competitiveness and tourism. Is less consistent with local regeneration initiatives as it lacks a local focus.		Positive Impact

Appraisal Summary Table

Figure 3.4

Option: Strategy D		Description: Symptom Approach	Problems	Present Value Cost To Government £1780M
OBJECTIVE	SUB-OBJECTIVE	QUALITATIVE IMPACTS	QUANTITATIVE MEASURE	ASSESSMENT
ENVIRONMENT	Noise	In 15th year 56 zones 'losers', 16 zones 'winners'. Zonal 'winners' generally associated with traffic reductions, zonal 'losers' associated with traffic increases and increased levels of rail services. Indicates disbenefits are spread across the region. Net impact results from distribution of population between zones.	Change in estimated population annoyed in 15 th year with Strategy compared with present Do-Minimum: +8610 people	Change in estimated population annoyed in 15 th year with Strategy compared with future Do Minimum situation: +4237 people
	Local Air Quality	For Nitrogen Dioxide, 3 of the winning districts, but 4 of the losing districts, have air quality problems (AQMA). Thus disbenefits from the strategy are worse than suggested by the AST. For PM10, 3 of the winning districts and 3 of the losing districts have air quality problems (AQMA). These results do not affect the conclusions of the AST.	NO2: 26 zones winners NO2: 46 zones 'losers' NO2: 1 zone no change PM10: 24 zones 'winners' PM10: 32 zones 'losers' PM10: 16 zones no change	Emission Estimate NO2: -3,456,114 Emission Estimate PM10: -68,341
	Greenhouse Gases	Includes both rail and road emissions.		Increase of 286,526 tonnes CO2 per year (+2%)
	Landscapes	This strategy contains a significant number of road schemes, the majority of which are expected to have a negative impact upon the landscape. However, the affected landscapes are rarely of quality higher than local importance.		Negative Impact
	Townscape	Due to the majority of schemes occurring on motorways and the strategic road network, the schemes bypass and already impact on the townscape of urban areas. This results in a mainly insignificant impact on townscape from this strategy.		Insignificant Impact
	Heritage of Historic Resources	Due to the extent and nature of the road schemes in this strategy, the potential impact on heritage is wide reaching. However, the specific location of these heritage features in relation to the schemes is uncertain, at this stage of strategy development.		Uncertain Impact
	Biodiversity	The high number of new road schemes and traffic management schemes produce a potential local impact on the biodiversity for the vast majority of the schemes. However, due to the majority of schemes impacting only on local biodiversity and the potential for mitigation, the overall impact is deemed insignificant at the strategic level.		Insignificant Impact
	Water Environment	With the greater development of new road and rail infrastructure, there is an increased likelihood of impacts on the water environment. However, overall impacts generally remain localised with, in many cases, the opportunity for mitigation. Significant lengths of motorway widening may have more significant effect on a regional basis, however mitigation of these may be possible - hence uncertain impacts.		Uncertain Impact
	Physical Fitness	Measures to improve public transport could either increase or decrease physical fitness depending on whether people switch modes and then access public transport using walking or cycling or if they generally use public transport instead, and thus carry out less physical activity. The effect of Strategy D on 'Physical Fitness' remains unclear.		Uncertain Impact
SAFETY	Journey Ambience	Benefits in journey ambience are likely to occur due to improvements in integration, public transport, traffic management, new roads and reductions in HGV's due to freight measures.		Moderate Beneficial Impact
	Accidents	Small accident benefits associated with improved highway infrastructure.	Savings: Fatal: 44 Serious: 200 Slight: -4146	PVB £1M
ECONOMY	Security	The provision of help points and CCTV in unstaffed interchanges and improved lighting will help to improve personal security.		Moderate Beneficial Impact
	Transport Economic Efficiency	Excludes impact of additional rail passenger fare revenue and potential public sector income arising from fiscal traffic restraint measures.		Users: NPV £1336M Private providers: NPV £-1724M Public providers: NPV £-479M Other Government: NPV £-1345M
	Reliability	Improvements to the strategic highway network, demand management proposals and measures to encourage a mode shift from highway modes car to public transport would enhance capacity and restrict demand, thus improving journey time reliability. Proposals for new rail services and stations matched by significant increases in track/signalling capacity.		Slight Beneficial Impact
ACCESSIBILITY	Wider Economic Impacts	Enhances the strategic rail and road links between the regeneration zones within the Study area (Cornwall and parts of Devon) and the rest of the country which assists with overcoming peripherality.		Positive Impact
	Option Values	Three new rail stations provide strong beneficial effects at local level. Enhancements to rail station public transport access and coach services will include limited new options.		Slight Beneficial Impact
	Severance	Provides relief from existing severance for certain settlements along the A303, A30 and A38. These benefits are considered to outweigh any slightly negative effects that may result from online improvements elsewhere; thus a moderately positive result is recorded.		Moderate Positive Impact
INTEGRATION	Access to the Transport System	Major effects associated with introduction of demand responsive public transport feeder services	Do Min Access Index: 74.7 Strategy D Access Index: 84.1	Moderate Beneficial Impact
	Transport Interchange	The upgrading of existing interchanges, improved information for all travellers, coach network upgrades and Park and Ride measures will provide a moderate beneficial impact.		Moderate Beneficial Impact
	Land-Use Policy	Performs well against most national and regional guidance, but less well against some LTP strategies.		Positive Impact
	Other Government Policies	Consistent with other Government policies relating to competitiveness, tourism and access to employment opportunity. Lack of emphasis on changing travel demand has potentially adverse implications for protection of agricultural assets, air quality, and neighborhood renewal.		Neutral Impact

4 The Emerging Strategy

4.1

Introduction

4.1.1

This chapter describes the Emerging Strategy. This Emerging Strategy will then be subject to discussion and debate with a range of stakeholders before deciding upon its final form.

4.2

The Emerging Strategy

4.2.1

The Emerging Strategy has many component parts, as described below. They reflect the findings from the appraisal of the four Composite Strategies, plus other work. There are thirteen component parts:

- Reducing the need to travel
- Better integration for public transport
- Promote use of public transport to/from main urban areas
- Traffic restraint within main urban areas
- New road and rail infrastructure
- Provide more opportunities to travel by rail
- More opportunity for freight to use rail
- Improve coach and express bus networks and facilities
- Demand responsive public transport in rural areas
- Smarter use of existing roads
- Local road safety and other measures
- Expand air and sea networks
- Specific measures to assist tourism

(1) *Reducing the need to travel*

4.2.2

We envisage this including measures to:

- encourage more sustainable working practices such as increased use of teleworking, greater flexibility of working hours, increased use of video and audio conferencing, employee travel plans and school travel plans.
- encourage greater use of the Internet, particularly in respect of shopping journeys.
- encourage developments to take place in locations which are accessible by public transport, cycling and walking.

- encourage more sustainable travel choices through 'hearts and minds' campaigns and general education.

4.2.3 Reducing travel demand is particularly aimed at reducing demand for car journeys, and targets specific journey types that could be made by means other than car (or not made at all), but with no loss of the utility that that trip provides. Successful reduction in car demand has direct benefits in terms of reduced environmental impact, fewer accidents, reduced congestion and more reliable journey times.

4.2.4 It is acknowledged that reducing the need to travel is not straightforward, although it should also be noted that 'reducing the need to travel' is seeking to reduce the growth in overall demand rather than absolute reductions in today's trip demand. It is envisaged that encouragement will involve education and direct intervention in the form of regulations where necessary.

4.2.5 Reducing the need to travel is a fundamental part of the strategy, and without a reduction in the rate of trip making and traffic growth from that predicted, it is not possible that transport infrastructure alone can be developed to keep pace with the demands imposed by such growth.

(2) *Better integration for public transport*

4.2.6 We envisage this including measures to:

- support through-ticketing across all modes of public transport.
- greater connectivity between different public transport modes.
- provide more reliable and up-to-date travel information across all modes of public transport.
- enhanced transport interchanges which are fully accessible and with better quality facilities for travellers.
- enhanced cycle and walk access to public transport interchanges.

4.2.7 A significant criticism of public transport is that it fails to provide a total solution for making a journey. For example, it may be possible to find out when and where the trains go from the local station, but getting to the station, and indeed to the final destination, is not always an easily planned or executed operation.

4.2.8 Better integration across the provision of public transport will help to increase its attractiveness versus that of the private car. It will also assist those travellers without access to a car.

(3) *Promote use of public transport to/from main urban areas*

4.2.9 We envisage this including measures to:

- provide additional 'suburban' rail services in the main urban areas.
- provide associated rail infrastructure to ensure that other rail services are not compromised.
- provide new rail stations where they increase rail catchment areas to/from urban areas.
- provide enhanced bus priority within urban areas.
- enhance bus services to/from and within urban areas, making use of priority measures.
- encourage development and use of Park and Ride in appropriate locations.

4.2.10 Examples of specific measures that could be included are:

- light rapid transit in Bristol.
- new and enhanced rail services in the Taunton – Weston-super-Mare – Bristol – Gloucester corridor, between Oxford and Bristol, and serving Exeter, Plymouth and Reading.
- re-instatement of services to Tavistock (the 'Drake Line')
- re-instatement of the Portishead rail line for passengers (as well as freight).

4.2.11 Main Urban Areas suffer particularly acute transport problems at peak commuting times. Greater choice, improved quality of service and reduced journey times on the public transport networks will help to address this.

(4) *Traffic restraint within main urban areas*

4.2.12 We envisage this including measures to:

- reduction in the number of long-stay parking spaces.
- adopt charging systems to reflect either congestion or parking behaviour.
- reallocation of road space to favour public transport, cycling and walking.

4.2.13 Examples of specific measures that could be included are:

- real-terms increases in parking charges in urban areas
- congestion charging in some urban areas (such as planned in Bristol and central London)

4.2.14

An integrated transport strategy, if it is to have effect, must encompass both the 'carrot' and the 'stick', particularly in urban areas. As such, whilst traffic restraint can itself be used as a tool for reducing urban congestion, it is also required in the main urban areas to reinforce the provision of enhanced public transport. The balance of 'carrot' and 'stick' approaches will need to vary between areas, given that re-allocation of road space can increase congestion in some circumstances.

(5) *New road and rail infrastructure*

4.2.15

We envisage this including measures to provide:

- a direct dual-carriageway standard route along the A303/A30 corridor from the M25/M3 to Cornwall
- additional physical capacity at key points on the motorway network – generally targeted at specific vehicle and/or user types.
- an increase in the capacity of rail network (all corridors) and relieving local bottlenecks at stations and junctions in order to provide more opportunities for use of rail (particularly for passengers and freight around urban areas).

4.2.16

Examples of specific measures that could be included are:

- upgrade A303/A30 route to dual-carriageway standard – note that the route between Ilminster and Exeter needs more detailed consideration than is appropriate when defining the Emerging Strategy.
- Waterloo-Exeter track upgrades (double track between Salisbury and Honiton).
- additional running lines between Reading and Paddington.
- extra rail running lines between Swindon and Didcot.
- re-instatement of double track between Swindon and Kemble.
- grade-separation of key rail junctions such as Reading East, Wootton Bassett and Didcot.
- re-modelling of stations such as Reading, Paddington, Swindon for greater capacity.

4.2.17 The key benefits of new road and rail infrastructure will be to improve journey time reliability and improve safety, as well as reducing journey times. It also provides additional capacity to better deal with ‘incidents’ on the main transport corridors as and when they arise.

(6) *Provide more opportunities to travel by rail*

4.2.18 We envisage this including measures to provide:

- new (local and parkway) and upgraded stations on all corridors.
- new and more frequent services on all corridors.
- improved rolling stock on all corridors.

4.2.19 Examples of specific measures that could be included are:

- possible sites for new stations exist on most lines, with a number of opportunities between Exeter and Waterloo, and between Bristol and Reading.
- significantly enhanced services from Paddington (core service of three trains per hour to each of the principal destinations – Bristol, Plymouth and Cardiff – with many going to stations beyond).
- enhanced service for intermediate stations on Berks & Hants line.
- enhanced service Waterloo-Exeter (up to 2 trains per hour).
- increased services at Hayes & Harlington as a gateway to Heathrow.

4.2.20 An increased number of rail services and the opening of selective new stations will provide a more attractive rail network to the travelling public. It will provide more flexibility in journey choice as well as make journeys more convenient.

(7) *More opportunity for freight to use rail*

4.2.21 We envisage this including measures to:

- construct new multi-modal freight terminals to facilitate road/rail transfer, and improve access to those currently in existence.
- create sufficient capacity in non-road modes to accommodate growth in rail freight demand.
- enhance rail loading gauge.

4.2.22 Examples of specific measures that could be included are:

- rail enhancements already described (such as additional tracks) – these will also help freight services to be more reliable.
- rail loading gauge enhancements on key core routes (London – Bristol/South Wales – Exeter).

4.2.23 The efficient movement of freight is vital to the economy. However, more can be done to improve the competitiveness of moving freight by rail.

(8) *Improve coach and express bus networks and facilities*

4.2.24 We envisage this including measures to provide:

- new and improved coach services.
- new interchange facilities at coachways.
- priority measures on strategic routes.
- better integration with local bus services.
- improved on-vehicle and interchange facilities.

4.2.25 Examples of specific measures that could be included are:

- a target frequency of two coaches per hour between major urban areas on a trunk haul network focused on London – Bristol – Exeter.
- new/enhanced coachways at locations such as Reading, Swindon, Bristol, Weston-super-Mare and Taunton.
- quicker access to centrally located bus terminals in London, Bristol, Plymouth, Exeter, etc.

4.2.26 The coach and express bus network performs a distinct role within an overall transport strategy by catering for specific markets. Improvements to the service will increase patronage and help to effect modal shift.

(9) *Demand responsive public transport in rural areas*

4.2.27 We envisage this including measures to provide:

- demand responsive public transport to link with rail and coach interchanges.

4.2.28 Examples of specific measures that could be included are:

- the key aspect of demand responsive services will be to provide ‘certainty’ of being able to continue a journey, particularly outside core operating hours – communications between services form a key part of the success of demand responsive services.
- as well as enhanced conventional bus services linking with stations where appropriate, there is a need to link areas that may not justify such services – similarly for linkages in all areas at early or late off-peak times. Solutions ranging from full-service demand responsive buses such as the Wiltshire Wigglybus, to flexible use of local taxis are potentially included.

4.2.29

Those without access to a car in rural areas will be excluded from enjoying the benefits of an enhanced transport system unless they are able to gain access to the main transport corridors at reasonable cost. Likewise, many travellers would welcome the certainty of an onward public transport connection to their destination.

(10) *Smarter use of existing roads*

4.2.30

We envisage this including measures such as:

- access controls such as ramp metering at busy motorway junctions.
- implementation of ITS measures for better traffic management and control, speed management, variable speed limits, tidal flow operations, automatic incident detection and lane priorities.

4.2.31

Examples of specific measures that could be included are:

- access controls may be appropriate at a number of motorway junctions on the M3 between Junctions 2 and 6, M4 between 5 and 11 and at Swindon and Bristol, and the M5 around Bristol and Exeter.
- ITS measures on sections such as the M4/M5 around Bristol, M3 Junction 2-6, M4 between Maidenhead and Slough and around Reading and M5 around Exeter.

4.2.32

Technology is evolving which enables the strategic road network to operate more efficiently without recourse to physical upgrading. This allows for flexible operating regimes to be introduced as conditions on the network change, and allows greater control to be exerted on the traffic flows.

(11) *Local road safety and other measures*

4.2.33 We envisage this including measures to deal with:

- local 'hot spot' and other schemes to address specific problems of safety, environment, congestion, accessibility and integration.

4.2.34 Examples of specific measures that could be included are:

- traffic management and alterations at junctions, lighting improvements, signage improvements, layby improvements and junction grade separation.

4.2.35 Even with limited new infrastructure and smarter use, there will remain some locations on the main road corridors which experience problems. Such locations can benefit from a variety of low cost interventions.

(12) *Air and sea networks*

4.2.36 We envisage this including measures to:

- improve landside access to key airports in the SWARMMS area.
- improve western access by rail to Heathrow.
- support landside access to key ports.

4.2.37 Examples of specific measures that could be included are:

- enhanced access to Bristol International.
- enhanced train links to Hayes & Harlington gateway to Heathrow (as mentioned earlier).

4.2.38 Airports and ports provide important 'Gateways' for the SWARMMS area. Access to key airports and ports should be improved to maintain their competitiveness and to assist in developing an increased range of services by both air and sea. Improving access to Heathrow from the west is important if modal shift to rail is to be achieved.

(13) *Specific measures to assist tourism*

4.2.39 We envisage this including measures such as:

- expanded motorail service serving different locations and with more stops en-route.
- hire car/public transport packages with incentives for families/groups.
- call centre to advise on packages, including travel and accommodation.

4.2.40

Whilst tourists and the tourist industry will also benefit from other parts of the Emerging Strategy there are some key actions that can be undertaken to provide specific benefits within that sector. This will assist in improving travel choice as well as encouraging modal shift away from the private car.

4.3

Rejected Components

4.3.1

There are several possible components of any strategy which have not been included in the Emerging Strategy. These include:

- major new road and rail routes
- motorway and inter-urban road tolling
- junction (motorway) closures

Major new Road and Rail routes

4.3.2

The study has established that whilst it is appropriate to consider significant enhancement of existing corridors, forging entirely new corridors would be unlikely to produce benefits that would outweigh the obvious significant disadvantages. There are two basic considerations in this respect, namely environmental disbenefits and cost.

4.3.3

When considering new road corridors the disadvantages are largely related to environmental impacts, as the cost of a new route may not be significantly different to upgrading an existing one in some instances.

4.3.4

One new route that was considered was for a new motorway 'box' around Bristol. Whilst this would provide a direct dual carriageway route that avoids the congested part of the motorway network, the areas it would have to traverse to the south of Bristol are very sensitive. The option of creating an entirely new motorway route from the M25 to Cornwall was also considered but could not be justified on traffic demand as well as having significant environmental disbenefits.

4.3.5

A new rail route built to high-speed standards was also considered. New rail infrastructure has similar, albeit slightly reduced, environmental considerations. The cost of such infrastructure is also a major issue. It was not considered that,

given prevailing financial considerations in the operation of the rail industry, that expenditure on such a route could be justified, or recouped.

Motorway and inter-urban road tolling

4.3.6 Direct charging for road use is a proven way of paying for specific pieces of infrastructure (such as estuary crossings), and is increasingly being seen as an appropriate way of discouraging excess traffic where congestion is a problem. Congestion charging is thus being considered in a number of urban areas.

4.3.7 However, as some examples of estuarial crossings have already shown, there can be diversion effects if alternative routes exist such that drivers can avoid the tolled sections. Indeed, this has been evident from the transport modelling exercises carried out during the study, with significant diversion to local roads being modelled when either motorways and/or main routes are tolled, and others are not. As such, it is felt that motorway and/or inter-urban road tolling could not be successfully implemented while there is no direct charge for the use of other routes. (Having said this, there may be more opportunity for this approach closer to London and this will be examined in greater detail in the London-Reading Multi-Modal study).

4.3.8 Direct charging while using all roads is becoming feasible as technology improves, and as such should not be discounted. Indeed it may prove of significant merit as a future national policy. However, such a system would require reference to the total charges levied with relation to motoring, and is thus in need of detailed further consideration.

Motorway junction closures

4.3.9 The contention that motorways should be for 'strategic' long-distance journeys is often at odds with the usage made of certain key sections of the network. In particular, motorways that pass close to or through urban areas are often used for trips between parts of the urban area, or for short-distance urban area access trips. As such, a relatively simple form of restraint that has been considered would see some or all movements banned completely. This is an appealing tool in that by making some routes unavailable, if the movements targeted are a significant proportion of the total, a significant effect can be had on congestion on the motorway.

4.3.10

However, as with tolling, there is the issue of displaced trips, and SWARMMS modelling work again suggests significant increases in the usage of surrounding routes. Hence, whilst some closures (perhaps at only certain times of the day) may have a role within a local context, they have no overall place in the Emerging Strategy.

5 Appraisal of the Emerging Strategy

5.1 *Introduction*

5.1.1 This chapter describes the full GOMMMS appraisal of the Emerging Strategy. It follows a similar structure to earlier, covering the:

- Appraisal Summary Table (AST);
- Additional Appraisal Criteria (AAC); and
- Supporting Analyses.

5.2 *Results of the Appraisal –AST*

5.2.1 The AST for the Emerging Preferred Strategy is shown in Figure 5.1.

5.3 *Results of the Appraisal – AAC*

5.3.1 The findings from the seven Additional Appraisal Criteria are summarised below, the results of the Emerging Strategy (ES) being compared to the ‘Do Minimum’.

(1) *Reducing the need to travel*

Table 5.1 : Reducing the need to travel

Total passenger kilometres (rail and car) – millions @ 2016

	Do Minimum	ES
Whole study area	20.02	17.70
% change from 2000	37.9%	21.9%
% change from Do Min	-	-11.6%

Total Passenger kilometres (car) – millions @ 2016

	Do Minimum	ES
Whole study area	19.05	16.75
% change from 2000	37.1%	20.5%
% change from Do Min	-	-12.1%

Comment: The Emerging Strategy provides a significant reduction in the amount of travel experienced in 2016 relative to the Do Minimum (12%). However, the increase in travel for the Emerging Strategy relative to existing 2000 levels is still very large (22%).

(2) *To increase the proportion of journeys made by non-car modes in the study area*

Table 5.2 : Percentage of rail passenger kilometres – @ 2016

	Do Minimum	ES
% rail trips	4.9%	5.4%

Comment : The Emerging Strategy is successful in increasing the proportion of journeys made by rail in the study area, an increase of 10% over the Do Minimum (and an increase of 26% relative to existing levels). However, rail passenger kilometres still comprise a relatively small amount of total travel.

(3) *To improve connectivity within the study area*

Table 5.3 : Improving connectivity

Journey times (Road and Rail) – minutes @ 2016

	Do Minimum	ES
Plymouth-Bristol (car)	151	133
Plymouth-Bristol (rail)	156	145
Taunton-Reading (car)	137	112
Taunton-Reading (rail)	130	118
Salisbury-Basingstoke (car)	44	43
Salisbury-Basingstoke (rail)	70	63

Frequency and capacity of rail services - @ 2016

	Do Minimum	ES
Trains/hour		
Plymouth-Bristol	1.1	2.1
Taunton-Reading	1.1	2.3
Salisbury-Basingstoke	2.0	3.8
Seats/hour		
Plymouth-Bristol	271	726
Taunton-Reading	502	1026
Salisbury-Basingstoke	392	745

Comment : The Emerging Strategy provides a notable reduction in journey times between key centres for both road and rail compared to the Do Minimum. Moreover, train services are typically twice as frequent with a corresponding increase in capacity.

(4) *To reduce the peripherality of Devon and Cornwall*

Table 5.4 : Reducing peripherality

Journey times (road and rail) – minutes @ 2016

	Do Minimum	ES
Exeter-London (car)	199	182
Exeter-London (rail)	184	150
Exeter-Bristol (car)	86	83
Exeter-Bristol (rail)	89	79
Penzance-Exeter (car)	112	109
Penzance-Exeter (rail)	204	182

Frequency and capacity of rail services - @ 2016

	Do Minimum	ES
Trains/hour		
Exeter-London	2.1	5.5
Exeter-Bristol	2.3	3.3
Penzance-Exeter	0.5	1.0
Seats/hour		
Exeter-London	588	1284
Exeter-Bristol	555	839
Penzance-Exeter	228	456

Comment : Journey times are reduced for movements in and out of Devon and Cornwall under the Emerging Strategy relative to the Do Minimum. These are particularly marked for rail journeys. The frequency of rail services is also significantly improved, as is their capacity.

(5) *To reduce congestion at key locations on the road network*

Table 5.5 : Reducing road congestion

Number of links over capacity - @ 2016 average hour

	Do Minimum	ES
1 way links v/c >0.8	248	202

Operating conditions at key locations (v/c) - @ 2016 average hour

	Do Minimum	ES
M4/M5 around Bristol		
M4 Jcn 19-Jcn20	1.00	0.68
M4 Jcn 19-Jcn18	0.50	0.35
M5 Jcn 20-Jcn19	0.56	0.41
M5 Jcn 19-Jcn18a	0.39	0.30
M5 Jcn 18a-Jcn17	0.49	0.33
M4 Swindon		
Jcn 16-Jcn 15	0.46	0.41
Jcn 15-Jcn 14	0.46	0.31
M4 Reading		
Jcn 10-Jcn8/9	0.70	0.67
Jcn 7 – Jcn 6	0.80	0.76
Jcn 8/9- Jcn 7	0.80	0.75
Jcn 6 –Jcn 5	0.99	0.83
A303		
Bishopwood	0.30	0.16
Ilminster bypass	0.64	0.42
Mere bypass	0.25	0.26
Chicklade	0.58	0.26
E. of Longbarrow	0.29	0.27
E. of Countess	0.35	0.32
Thruyton	0.34	0.32
Andover, A3048-A34	0.52	0.48
Micheldever	0.46	0.43
M3		
Jcn 9 – Jcn 8	0.55	0.53
Jcn 8 – Jcn 7	0.61	0.58
Jcn 7 – Jcn 6	0.55	0.52
Jcn 6 – Jcn 5	0.64	0.62
Jcn 5 – Jcn 4a	0.55	0.51
Jcn 4a – Jcn 4	0.75	0.69
Jcn 4 – Jcn 3	0.75	0.70
M5		
Jcn 20-21	0.56	0.42
Jcn 21-22	0.57	0.43
A358		
M5-A378	0.70	0.63
A378-A303	0.48	0.54

Comment : The Emerging Strategy provides significant reductions in congestion on the M4/M5 around Bristol relative to the Do Minimum. Other key locations show similar improvement, albeit generally to a lesser degree. The smallest benefits are shown on the M3.

(6) *To reduce congestion at key locations on the rail network*

Table 5.6 : Reducing rail congestion

Number of overcrowded trains

Volume/Seat Capacity	Do Minimum	ES
Bath-Swindon	0.59	0.21
Swindon -Bristol P'way	0.45	0.29
Westbury-Newbury	0.75	0.24
Bath-Bristol	0.55	0.46
Westbury-Frome	0.52	0.32
Weston-S-M – Bristol	0.32	0.24
Weston-S-M – Taunton	0.29	0.19
Swindon-Didcot	0.59	0.29
Exeter-Taunton	0.35	0.19
Crewkerne-Axminster	0.27	0.12
Reading-Twyford	0.90	0.53
Maidenhead-Slough	1.03	0.66
Farnb'h-Basingstoke	0.84	0.62
Newbury-Reading	0.65	0.38
Salisbury-Basingstoke	0.56	0.33
Salisbury-Gillingham	0.47	0.22
Exeter-Plymouth	0.36	0.16
Saltash-Plymouth	0.51	0.43

Comment : The Emerging Strategy provides a significant reduction in the number of overcrowded trains relative to the Do Minimum. This is evident on all lines.

(7) *To reduce seasonal congestion at key locations on the road network*

Table 5.7 : Reducing Seasonal Congestion

Operating conditions at key locations (v/c) - @ 2016 average August hour.

	Do Minimum	ES
A30/A303		
Honiton bypass	0.27	0.27
Bishopswood	0.42	0.22
Ilminster bypass	0.88	0.57
Mere bypass	0.34	0.36
Chicklade	0.80	0.35

	Do Minimum	ES
E of Longbarrow	0.39	0.37
E of Countess	0.48	0.44
Thrupton	0.47	0.44
Andover, A3048-A34	0.71	0.67
Micheldever	0.64	0.59
M5		
M5 J31-30	0.59	0.52
J30-29	0.69	0.66
A38		
Stoketon Cross	0.70	0.29
Halfway House	0.35	0.33
Dobwalls	0.20	0.19
A30		
Tolgus	0.28	0.26
Blackwater bypass	0.46	0.42
Marazanvose	0.25	0.12
Mount Pleasant	0.24	0.23
N of Bodmin	0.61	0.24
Launceston bypass	0.28	0.26
E of Launceston	0.26	0.21
Okehampton bypass	0.39	0.31
Tedbury St Martin	0.36	0.28

Operating conditions at key locations (v/c) - @ 2016 August Saturday hour

	Do Minimum	ES
A30/A303		
Honiton bypass	0.51	0.50
Bishopswood	0.77	0.41
Ilminster bypass	1.64	1.07
Mere bypass	0.64	0.67
Chicklade	1.49	0.66
E of Longbarrow	0.73	0.68
E of Countess	0.89	0.82
Thrupton	0.87	0.82
Andover, A3048-A34	1.32	1.24
Micheldever	1.18	1.10
M5		
M5 J31-30	1.17	1.04
J30-29	1.38	1.31
A38		
Stoketon Cross	0.66	0.28

	Do Minimum	ES
Halfway House	0.33	0.31
Dobwalls	0.19	0.18
A30		
Tolgus	0.61	0.56
Blackwater bypass	0.98	0.91
Marazanvose	0.54	0.26
Mount Pleasant	0.52	0.49
N of Bodmin	1.30	0.52
Launceston bypass	0.61	0.56
E of Launceston	0.56	0.46
Okehampton bypass	0.81	0.64
Tedbury St Martin	0.57	0.44

Comment : The Emerging Strategy provides overall benefits relative to the Do Minimum for an average August hour. Whilst it provides similar benefits for an August Saturday, there are still some sections of the A30/A303 and M5 which are forecast to be overcapacity.

5.4 ***Results of the Appraisal – Supporting Analyses***

Distribution and Equity

5.4.1 The Emerging Strategy provides significant benefit to public transport users, whether they be users of public transport by choice or those without a car available for their journey. This is evident in the measures put forward to improve integration, security, transport interchange and access to the transport system. Such improvements will provide particular benefits for those who are reliant on public transport for their journeys.

5.4.2 The measures provide benefit for both urban and rural travellers. These are particularly marked for those travelling to and from the Principal Urban Areas, the car-borne rural dwellers, or those who live in rural areas close enough to the new facilities to walk, cycle or use connecting public transport services.

Affordability and Financial Sustainability

5.4.3 An analysis has been carried out of the affordability and financial sustainability of the Emerging Strategy, using the same approach as was adopted for the Composite Strategies. The key assumptions are as follows:

- Highway capital scheme costs are all incurred directly by government and occur over the period 2001 – 2006;

- The effects of the strategies on highway maintenance and rail maintenance costs have been excluded;
- Rail capital scheme costs are assumed to be incurred by the private sector but covered by 100% grant from government;
- Rail capital schemes costs are assumed to be incurred over the period 2001 – 2006, although it is recognised that in practice a number of schemes may not be complete by 2006 ;
- Additional rail operating costs are assumed to be incurred by the private sector on an annual basis from 2006 – 2035; and
- For ‘other measures’ it has been assumed that the costs are incurred in the period 2001 – 2006, although it is recognised that in practice some of the costs might be incurred as running costs spreading over the full 30 year appraisal period.

5.4.4 It should also be noted that all costs are considered relative to the Do Minimum situation; therefore the costs of all schemes and measures which are within the Do Minimum have not been included.

5.4.5 For the purposes of appraising the Emerging Strategy we have chosen to exclude those elements of cost which we consider would be primarily funded through the Local Transport Plan process, in order that there is no double counting of costs.

5.4.6 There are a number of other cost elements that have not been explicitly taken into account to date due to some of the uncertainties described above. In due course as the Strategy is further developed, it is anticipated that these elements will be considered:

- Running costs associated with the operation of new bus and coach services;
- Additional revenue associated with additional bus and coach passengers;
- Costs associated with enhancing ports and airports, and access to these facilities; and
- Capital costs of creating new freight facilities and operating costs associated with running additional freight services.

The estimated costs associated with the Emerging Strategy are as follows:

Element	*Cost/ (Revenue) £M	Years Incurred	Source
Highway Capital costs	604	2001 –2006	Public sector – direct
Rail Capital costs	2076	2001 –2006	Private sector – 100% grant aided by government
Other measures costs	241	2001 –2006	Public sector – direct
Rail Operating Costs	195 per annum	2006 – 2035	Private sector
Rail Farebox Revenue	+	2006 – 2035	Private sector
Revenue from fiscal traffic restraint measures**	(1617) per annum	2006 – 2035	Public sector

* Relative to Do Minimum situation

+ Omitted pending further analysis of rail overcrowding and reliability

** Elements of this revenue relate to measures which will be funded through the Local Transport Plan process and is therefore not directly comparable with other items.

5.4.7 In summary this analysis suggests that the total cost to Government of the Emerging Strategy would be £2921M including both direct and grant funded costs. In addition, the rail industry would need to fund additional operating costs of new rail services of £195M per annum. As highlighted earlier there are a considerable number of issues regarding the costing and funding of the recommendations from the Multi Modal Studies which have yet to be resolved and as result, these estimates can only be considered as preliminary at this stage.

Practicality and Public Acceptability

5.4.8 Many stakeholders have argued that a strong emphasis within any Emerging Strategy should be given to reducing the need to travel. Many others, however, argued for significant levels of new infrastructure across all modes of transport. The Emerging Strategy, having elements of both, should therefore be regarded by the majority of stakeholders as reasonably well balanced.

5.4.9 Notwithstanding this, however, there are likely to be strong objections from some stakeholders on the extent of new road infrastructure, and disappointment from others that not enough new roads are proposed. The former provide the greater risk to the strategy, given that subsequent public inquiries could ultimately delay or, at worst, prevent the Emerging Strategy from being implemented.

5.4.10

A further risk in implementing the Emerging Strategy is the degree to which local authorities are required to play their part in achieving a mode switch to the more sustainable modes of transport. Whilst the mechanisms for this are now in place through the Local Transport Plan process, it will require local authorities, particularly in the Principal Urban Areas, to provide both 'carrot' and 'stick' in their local areas. The introduction of sufficient traffic restraint is likely to be the major stumbling block.

5.4.11

Another risk in the Emerging Strategy is in the ability of the rail industry to provide the level of infrastructure and service improvements being proposed. The rail industry is under great pressure at the present time to provide such measures throughout the UK and this is likely to continue for the foreseeable future. Such improvements, however, are an essential component of the Emerging Strategy.

Appraisal Summary Table

Figure 5.1

Option: Emerging Strategy		Description:	Problems	Present Value Cost To Government £1947M
OBJECTIVE	SUB- OBJECTIVE	QUALITATIVE IMPACTS	QUANTITATIVE MEASURE	ASSESSMENT
ENVIRONMENT	Noise	In 15th year: 44 zones 'losers', 28 zones 'winners'. The losers are largely associated with increased rail services whilst the 'winners' are associated with traffic reductions. The analysis indicates benefits and disbenefits are spread across the region.	Change in estimated population annoyed in 15 th year with Strategy compared with present Do-Minimum: +2622 people	Change in estimated population annoyed in 15 th year with Strategy compared with future Do-Minimum: +7797 people
	Local Air Quality	With regard to NO2, 6 of the winning zones but 2 of the losing zones have existing air quality problems (indicated by declared Air Quality Management Area status). Thus the benefit of the strategy is more than suggested by the AST scores. With regard to PM10, 8 of the winning zones and none of the losing zones have existing air quality problems (Air Quality Management Area). Thus the benefit of the strategy is more than suggested by the AST scores. LAQ includes rail and road emissions.	NO2: 67 zones 'winners' NO2: 5 zones 'losers' NO2: 0 zone no change PM10: 65 zones 'winners' PM10: 5 zones 'losers' PM10: 2 zones no change	Emissions Estimate NO2: -16,595,723 Emissions Estimate PM10: -916,139
	Greenhouse Gases	Includes both rail and road emissions	69 zones with decrease 3 zones with increase 0 zones with no change	Reduction of 1,678,510 tonnes of CO2 per year (-9%)
	Landscape	Due to the substantial amounts of new road and rail infrastructure, the majority of the schemes have a negative impact on locally and nationally designated landscape areas such as Blackdown Hills, Cotswolds and Chilterns AONB.		Negative Impact
	Townscape	The proposed new road infrastructure concentrates on the strategic road network, resulting in mainly indirect impacts on townscape. However, villages such as Monkton and Newtown on the A303, may be affected.		Insignificant Impact
	Heritage of Historic Resources	Due to the extent and nature of the road schemes in this strategy, the potential impact on heritage is wide reaching. The specific location of these heritage features in relation to the schemes is uncertain, due to the lack of detail of schemes at this strategic level.		Uncertain Impact
	Biodiversity	Whilst some road infrastructure schemes probably have a negative impact on local and national designations, the majority of schemes do not have a significant impact on biodiversity.		Insignificant Impact
	Water Environment	Road and rail infrastructure changes are focussed on upgrades to existing routes. Overall impacts generally remain localised with, in many cases, the opportunity for mitigation. On a regional scale the overall impact on the water environment is insignificant.		Insignificant Impact
	Physical Fitness	Aims to reduce growth of traffic and substantially improve public transport services which could either increase or decrease physical fitness depending on the activities which are substituted for car travel and replaced by public transport usage. If cycling, walking or other physical activity increases this could be positive but the effect of the Strategy on 'Physical Fitness' remains unclear.		Uncertain Impact
	Journey Ambience	Some benefits to journey ambience in terms of improving integration, implementation of next generation factors and local schemes. Greater improvements to public transport will improve 'Traveller Care'. The new roads (assuming well-designed) and traffic management will also reduce traveller stress. Reduction of HGV volumes will also reduce stress and fear of accidents.		Large Beneficial Impact
	SAFETY	Accidents	Significant accident savings associated with reduced highway demand and new highway infrastructure.	Savings: Fatal 230 Serious 1396 Slight 9412
Security		The provision of help points and improved lighting and CCTV at unstaffed interchanges will help to improve personal security at all interchanges across the study area.		Moderate Beneficial Impact
ECONOMY	Transport Economic Efficiency	Excludes impact of additional rail passenger fare revenue and potential public sector income arising from fiscal traffic restraint measures.		User Benefits: NPV £18,676M Private Providers: NPV -£1,900M Public Providers: NPV -£589M Other Government: NPV -£6,523M
	Reliability	Improvements to the transport networks will enhance capacity and improve journey time reliability. Proposals for new rail services and stations are matched by significant increases in track/signalling capacity.		Moderate Beneficial Impact
	Wider Economic Impacts	The strategy enhances the strategic rail and road links between the regeneration zones within the study area (Cornwall and parts of Devon) and the rest of the country, which assists with overcoming peripherality.		Positive Impact
ACCESSIBILITY	Option Values	Assumption of up to ten new rail stations provides strong beneficial effects at the local level for each station, and combined will provide overall study area wide opportunities, similarly for re-instatement of passenger rail services.		Moderate Beneficial Impact
	Severance	Provides direct relief from existing severance for around 850 people. Other places will experience increases in severance as a result of road upgrade to dual carriageway standard. However, these impacts are considered to be slight given that they pass through rural areas and pedestrian movement is likely to be low.		Slight Positive Impact
	Access to the Transport System	Major effects associated with introduction of demand responsive public transport feeder services and new stations.	Do Min Access Index: 73 Strategy Access Index: 100	Large Beneficial Impact
INTEGRATION	Transport Interchange	The upgrading of existing interchanges, improved information for all travellers and coach network upgrades will provide a moderate beneficial impact to all interchanges in the study area. Similarly for freight facilities.		Moderate Beneficial Impact
	Land-Use Policy	Performs well against national and regional guidance, as well as LTPs and Structure Plans.		Beneficial Impact
	Other Government Policies	Consistent with policies relating to competitiveness, tourism and access to employment opportunity. Emphasis on changing travel demand and modal shift in favour of public transport and slower modes has positive implications for the protection of agricultural assets, air quality, and neighbourhood renewal.		Beneficial Impact