Dover District Council

REGULATION 19 TRANSPORT MODELLING FORECASTING REPORT



70089926
OCTOBER 2022

PUBLIC

Dover District Council

REGULATION 19 TRANSPORT MODELLING FORECASTING REPORT

Type of document (version) PUBLIC

Project no. 70089926

OUR REF. NO. 70089926

Date: OCTOBER 2022

Dover District Council

REGULATION 19 TRANSPORT MODELLING FORECASTING REPORT

WSP

WSP House
70 Chancery Lane
London
WC2A 1AF

Phone: +44 20 7314 5000

Fax: +44 20 7314 5111

WSP.com

PUBLIC

Quality Control

Issue/revision	First issue	Revision 1	Revision 2
Remarks	DRAFT for DDC Comment	DRAFT for DDC Final Comment	FINAL
Date	23rd September 2022	13th October 2022	19th October 2022
Prepared by	Hayden Mc Carthy/ Jess Denny	Hayden Mc Carthy	Hayden Mc Carthy
Signature			
Checked by	Christine Elphicke	Christine Elphicke	Christine Elphicke
Signature			
Authorised by	Christine Elphicke	Christine Elphicke	Christine Elphicke
Signature			
Project number	70089926	70089926	70089926
Report number			
File reference	\\uk.wspgroup.com\Central Data\Projects\70089xxx\70089926 - Dover Local Plan Reg 19 Work\03 WIP\TP Transport Planning\05 Reports		

Contents

1	**INTRODUCTION**	**1**
1.1	**INTRODUCTION**	**1**
1.2	**MODEL EXTENT**	**1**
1.3	**MODEL SCENARIOS**	**2**
1.4	**PURPOSE OF THE REPORT**	**3**
1.5	**SUMMARY OF THE FORECASTING PROCESS**	**4**
1.6	**STRUCTURE OF REPORT**	**4**
2	**FORECASTING APPROACH**	**7**
2.1	**INTRODUCTION**	**7**
2.2	**FORECAST YEAR**	**7**
2.3	**FORECAST SCENARIOS**	**7**
2.4	**COMPLETIONS AND CONSENTED DEVELOPMENT**	**8**
2.5	**TEMPRO GROWTH**	**10**
2.6	**GENERALISED COST COMPONENTS**	**11**
2.7	**VISUM VERSION**	**11**
3	**FORECAST TRANSPORT INFRASTRUCTURE**	**13**
3.1	**INTRODUCTION**	**13**
3.2	**COMMITTED TRANSPORT INFRASTRUCTURE SCHEMES**	**13**
	A20 IMPROVEMENT SCHEME	13
	PROPOSED LINK ROAD, ALBERT ROAD	15
	LAND BETWEEN DEAL & SHOLDEN	16
	LAND ON THE WEST SIDE OF ALBERT ROAD, DEAL	17
3.3	**EXPLICITLY MODELLED DEVELOPMENT ASSUMPTIONS**	**17**
	Aylesham and Snowdown Sites	17
	St James's Site	18

Whitfield Urban Extension Plan 19
Connaught Barracks 20
3.4 PROPOSED JUNCTION IMPROVEMENTS 21
WHITFIELD ROUNDABOUT 21
3.5 SUMMARY 24
4 FORECASTING DEMAND 26
4.1 INTRODUCTION 26
4.2 METHODOLOGY 26
4.3 COMPLETED AND COMMITTED DEVELOPMENTS 27
COMPLETIONS 29
EXTANT SITES 29
EXPLICITLY MODELLED DEVELOPMENTS 29
TRIP RATES 36
TRIP GENERATION 40
TRIP DISTRIBUTION 40
4.4 BACKGROUND GROWTH 40
CAR GROWTH FACTORS 40
LGV/HGV GROWTH FACTORS 41
PORT GROWTH 42
4.5 MATRIX DEVELOPMENT 42
4.6 SUMMARY 43
5 LOCAL PLAN ASSESSMENT 45
5.1 INTRODUCTION 45
5.2 DO SOMETHING 45
REGULATION 19 HOUSING ALLOCATIONS 47
REGULATION 19 EMPLOYMENT ALLOCATIONS 48
REGULATION 19 WINDFALL SITES 51
NETWORK ASSUMPTIONS 52
EXPLICITLY MODELLED SITES 52

Whitfield Urban Expansion 53
TRIP RATES AND TRIP GENERATION 55
TRIP DISTRIBUTION 55
MATRIX TOTALS 56
5.3 SUMMARY 56

6 RESULTS 58

6.1 INTRODUCTION 58
6.2 MODEL CONVERGENCE 58
DO MINIMUM 59
DO SOMETHING 1 NO MITIGATION 59
DO SOMETHING 1 WITH MITIGATION 60
DO SOMETHING 2 NO MITIGATION 60
DO SOMETHING 2 WITH MITIGATION 61
6.3 DO MINIMUM VS BASE 62
6.4 DO MINIMUM VOLUME OVER CAPACITY ASSESSMENT 84
6.5 DO SOMETHING 1 NO MITIGATION VS DM 94
6.6 DO SOMETHING 2 NO MITIGATION VS DM 106
6.7 DO SOMETHING 1 WITH MITIGATION VS DO MINIMUM 118
6.8 DO SOMETHING 1 WITH MITIGATION, VOLUME OVER CAPACITY ASSESSMENT 138
6.9 DO SOMETHING 2 WITH MITIGATION VS DO MINIMUM 149
6.10 DO SOMETHING 2 WITH MITIGATION, VOLUME OVER CAPACITY ASSESSMENT 168
6.11 DO SOMETHING 1 WITH MITIGATION VS DO SOMETHING 1 NO MITIGATION 183
6.12 DO SOMETHING 2 WITH MITIGATION VS DO SOMETHING 2 NO MITIGATION 185

7 SENSITIVITY TESTS 188

7.1 INTRODUCTION 188
7.2 FASTRACK ASSESSMENT 188
V/C ANALYSIS 192

8 LOCAL JUNCTION MODELS 196

8.1	**INTRODUCTION**	**196**
	MODELLING SOFTWARE	197
	WHITFIELD ROUNDABOUT	199
	DUKE OF YORK ROUNDABOUT	203
	A2/A256 DUMBBELL ROUNDABOUT	205
	LONDON ROAD/ ALKHAM VALLEY ROAD	208
	A256/ BOYS HILL ROUNDABOUT	213
	DOVER ROAD/ GRAMS ROAD/ STATION ROAD	215
	A256/ A258 DEAL ROAD	220
	A256 SANDWICH ROAD BYPASS/ A257/ ASH ROAD	222
8.2	**SUMMARY**	**223**
9	**EXTERNAL LOCAL PLAN SITES**	**226**
9.1	**INTRODUCTION**	**226**
9.2	**METHODOLOGY**	**226**
	OBSERVED COUNT DATA	226
	DO MINIMUM	230
	DO SOMETHING 1	230
	DO SOMETHING LOCAL PLAN IMPACTS	234
	CLUSTER 1	234
	CLUSTER 2	234
	CLUSTER 3	235
	CLUSTER 4	235
	CLUSTER 5	236
	CLUSTER 6	237
10	**RECOMMENDATIONS**	**239**
10.1	**INTRODUCTION**	**239**
10.2	**FINDINGS**	**239**
10.3	**NEXT STEPS**	**239**

TABLES

Table 1-1: 2040 Dwellings and Jobs by Scenario 3

Table 2-1: Employment Density Matrix 9

Table 2-2: Modelled Development Classification 10

Table 2-3: TEMPro Housing and Job Growth Targets 10

Table 2-4: Generalised Cost Parameters, 2040 11

Table 4-1: Dover Authority Housing and Job Growth Predictions (DM Scenario) 27

Table 4-2: 2040 Do Minimum Scenario, Explicitly Modelled Housing and Employment Sites 32

Table 4-3: Committed Housing Developments, TA Vehicular Trip Rates (per dwelling) 37

Table 4-4: Committed Employment Developments, TA Vehicular Trip Rates 38

Table 4-5: DDTM TRICS Trip Rates 39

Table 4-6: Car Background Growth 2015 to 2040, AM Peak 40

Table 4-7: Car Background Growth 2015 to 2040, PM Peak 41

Table 4-8: Car Background Growth (Alternative Assumptions) 2015 to 2040, AM Peak 41

Table 4-9: Car Background Growth (Alternative Assumptions) 2015 to 2040, PM Peak 41

Table 4-10: NRTF LGV and HGV Growth Rates from 2015 to 2040 – South East (All Areas) 42

Table 4-11: Port of Dover Traffic Growth Forecasts 42

Table 4-12: 2040 Do Minimum Scenario Matrix Total Comparison 43

Table 5-1: Net Housing and Employment, Do Something vs Do Minimum 45

Table 5-2: Total Housing and Employment, Do Something Scenario 46

Table 5-3: DDTM DS Local Plan Regulation 19 Employment Site Details 50

Table 5-4: 2040 Do Something Scenario, Explicitly Modelled Potential Housing Allocations 53

Table 5-5: 2040 Do Something Scenario, Explicitly Modelled Regulation 19 Employment Allocations 54

Table 5-6: Do Something 1, Regulation 19 Local Plan Allocations, Net Trip Generation 55

Table 5-7: Do Something 2, Regulation 19 Local Plan Allocations, Net Trip Generation 55

Table 5-8: 2040 Do Something Scenario 1 Matrix Total Comparison 56

Table 5-9: 2040 Do Something Scenario 2 Matrix Total Comparison 56

Table 6-1: TAG Convergence Criteria 58
Table 6-2: 2040 Do Minimum Convergence, Results AM Peak 59
Table 6-3: 2040 Do Minimum Convergence, Results PM Peak 59
Table 6-4: 2040 Do Something 1 No Mitigation Convergence, Results AM Peak 59
Table 6-5: 2040 Do Something 1 No Mitigation Convergence, Results PM Peak 59
Table 6-6: 2040 Do Something 1 with Mitigation Convergence, Results AM Peak 60
Table 6-7: 2040 Do Something 1 with Mitigation Convergence, Results PM Peak 60
Table 6-8: 2040 Do Something 2 No Mitigation Convergence, Results AM Peak 60
Table 6-9: 2040 Do Something 2 No Mitigation Convergence, Results PM Peak 60
Table 6-10: 2040 Do Something 2 with Mitigation Convergence, Results AM Peak 61
Table 6-11: 2040 Do Something 2 with Mitigation Convergence, Results PM Peak 61
Table 6-12: Volume over Capacity Assessment Criteria 84
Table 6-13: V/C Links and Nodes Summary, Do Minimum Scenario, AM and PM Peak 93
Table 6-14: V/C Links and Nodes Summary, Do Something 1 with Mitigation vs Do Minimum 147
Table 6-15: V/C Links and Nodes Summary, Do Something 2 with Mitigation vs Do Minimum 177
Table 6-16: V/C Links and Nodes Comments Summary 179
Table 7-1: Modal Shift with the Implementation of Fastrack 190
Table 7-2: Difference between KCC uptake in Fastrack compared with Modal Shift Assessed 191
Table 7-3: V/C Links and Nodes Summary, Do Something 2 without Fastrack vs Do Something 2 with Fastrack 193
Table 8-1: Junctions exceeding Capacity in VISUM Model assessed in further detail 196
Table 8-2: 2040 Do Minimum Junction Modelling Results 200
Table 8-3: 2040 Do Something 1 Junction Modelling Results 200
Table 8-4: 2040 Do Something 2 Junction Modelling Results 201
Table 8-5: Duke of York Roundabout Performance, 2017 Base Year 203
Table 8-6: Duke of York Roundabout Performance, 2040 DM 204
Table 8-7: Duke of York Roundabout Performance, 2040 DS2 204
Table 8-8: 2015 Base Year, A2/A256 Junction Modelling Results 205
Table 8-9: 2040 Do Minimum, A2/A256 Junction Modelling Results 206

Table 8-10: 2040 Do Something 2, A2/A256 Junction Modelling Results 207
Table 8-11: 2015 Base, Alkham Valley Road Junction Modelling Results 210
Table 8-12: 2040 DM, Alkham Valley Road Junction Modelling Results 210
Table 8-13: 2040 DS2, Alkham Valley Road Priority Junction Modelling Results 211
Table 8-14: 2040 DS2 with Mitigation, Alkham Valley Road Signalised Junction Improvement, Modelling Results 211
Table 8-15: 2015 Base, A256/ Boys Hill Roundabout, Modelling Results 213
Table 8-16: 2040 DM, A256/ Boys Hill Roundabout, Modelling Results 214
Table 8-17: 2040 DS2 with Mitigation, A256/ Boys Hill Roundabout, Modelling Results 214
Table 8-18: 2019 Base Year, Dover Road/ Station Road, Modelling Results 216
Table 8-19: 2040 Do Minimum, Dover Road/ Station Road, Priority Junction Modelling Results (Existing layout) 217
Table 8-20: 2040 Do Something 2 with Mitigation, Dover Road/ Station Road, Priority Junction Modelling Results (Existing layout) 217
Table 8-21: 2040 Increases in Traffic at Station Road/ A258/ Grams Road 218
Table 8-22: 2040 DS2 with Mitigation, Station Road/ A258/ Grams Road Signalised Junction Improvement, Modelling Results 218
Table 8-23: 2015 A256 Sandwich Bypass/A258 Deal Road 220
Table 8-24: 2040 DM A256 Sandwich Bypass/A258 Deal Road 220
Table 8-25: 2040 DS1 with Mitigation A256 Sandwich Bypass/A258 Deal Road 221
Table 8-26: 2015 A256 Sandwich Road Bypass/A257/ Ash Road 222
Table 8-27: 2040 DM A256 Sandwich Road Bypass/A257/ Ash Road 222
Table 8-28: 2040 DS1 with Mitigation A256 Sandwich Road Bypass/A257/ Ash Road 223
Table 9-1: 2019 Data Collection 228
Table 9-2: Trip Generation for Master Sites 232
Table 9-3: Dover MSOA JtW Distribution Summary 233
Table 9-4: Shepherdswell Static Analysis, vehicles a minute 236
Table 9-5: External Local Plan Allocations, Junction Impacts, Do Something 1 vs Do Minimum 238

FIGURES

Figure 1-1: DDTM Study Area 2
Figure 3-1: Prince of Wales Junction Improvements 14
Figure 3-2: York Street Roundabout Junction Improvements 14
Figure 3-3: Proposed Link Road, Albert Road 15
Figure 3-4: Church Lane Development Layout 16
Figure 3-5: Albert Lane Road Layout 17
Figure 3-6: St James's Site, Approved Site Access Signal Scheme 18
Figure 3-7: Whitfield Urban Extension Plan, Proposed Highway Infrastructure Improvements 19
Figure 3-8: Connaught Barracks Masterplan and Associated Infrastructure 20
Figure 3-9: Whitfield Roundabout Junction Mitigation 22
Figure 3-10: Duke of York Roundabout Junction Mitigation 23
Figure 4-1: DDTM Do Minimum, Residential Committed Developments – Completions 33
Figure 4-2: DDTM Do Minimum, Residential Committed Developments - Extant Planning Permissions 34
Figure 4-3: DDTM Do Minimum, Employment Committed Developments – Completions 35
Figure 4-4: DDTM Do Minimum, Employment Committed Developments – Extant Planning Permissions 36
Figure 5-1: DDTM Do Something, Residential - Dover Local Plan Regulation 19 Allocations 47
Figure 5-2: DDTM Do Something, Employment - Dover Local Plan Regulation 19 Allocations 49
Figure 5-3: Do Something projected Future Windfall 51
Figure 5-4: Whitfield Urban Expansion, Associated Infrastructure, Do Something Scenario 54
Figure 6-1: DDTM 2040 Do Minimum New Links 62
Figure 6-2: DDTM 2040 Do Minimum – Base Flow Difference, Dover, AM Peak 63
Figure 6-3: Sandwich Road Northbound, 2015 Base (left) vs Do Minimum (right), AM Peak 64
Figure 6-4: DDTM 2040 Do Minimum – Base Flow Difference, Dover, PM Peak 65
Figure 6-5: DDTM 2040 Do Minimum – Base Flow Difference, Deal, AM Peak 66
Figure 6-6: DDTM 2040 Do Minimum – Base Flow Difference, Deal, PM Peak 67

Figure 6-7: DDTM 2040 Do Minimum – Base Flow Difference, Whitfield Roundabout, AM Peak 68

Figure 6-8: DDTM 2040 Do Minimum – Base % Flow Difference, Whitfield Roundabout, AM Peak 69

Figure 6-9: DDTM 2040 Do Minimum – Base Flow Difference, Whitfield Roundabout, PM Peak 70

Figure 6-10: DDTM 2040 Do Minimum – Base % Flow Difference, Whitfield Roundabout, PM Peak 71

Figure 6-11: DDTM 2040 Do Minimum – Base Flow Difference, Duke of York Roundabout, AM Peak 72

Figure 6-12: DDTM 2040 Do Minimum – Base % Flow Difference, Duke of York Roundabout, AM Peak 73

Figure 6-13: DDTM 2040 Do Minimum – Base Flow Difference, Duke of York Roundabout, PM Peak 74

Figure 6-14: DDTM 2040 Do Minimum – Base % Flow Difference, Duke of York Roundabout, PM Peak 75

Figure 6-15: DDTM 2040 Do Minimum – Base -Flow Difference, London Road Roundabout, AM Peak 76

Figure 6-16: DDTM 2040 Do Minimum – Base % Flow Difference, London Road Roundabout, AM Peak 77

Figure 6-17: DDTM 2040 Do Minimum – Base Flow Difference, London Road Roundabout, PM Peak 78

Figure 6-18: DDTM 2040 Do Minimum – Base % Flow Difference, London Road Roundabout, PM Peak 79

Figure 6-19: DDTM 2040 Do Minimum – Base Flow Difference, A256/ Deal Road Roundabout, AM Peak 80

Figure 6-20: DDTM 2040 Do Minimum – Base % Flow Difference, A256/ Deal Road Roundabout, AM Peak 81

Figure 6-21: DDTM 2040 Do Minimum – Base Flow Difference, A256/ Deal Road Roundabout, PM Peak 82

Figure 6-22: DDTM 2040 Do Minimum – Base % Flow Difference, A256/ Deal Road Roundabout, PM Peak 83

Figure 6-23: DDTM 2040 Do Minimum, V/C Assessment, Full Model Extent, AM Peak 84

Figure 6-24: DDTM 2040 Do Minimum, V/C Assessment, Full Model Extent, PM Peak 85

Figure 6-25: DDTM 2040 Do Minimum, V/C Assessment, Dover, AM Peak 86

Figure 6-26: DDTM 2040 Do Minimum, V/C Assessment, Dover Key Junctions, AM Peak 87

Figure 6-27: DDTM 2040 Do Minimum, V/C Assessment, Dover, PM Peak 88

Figure 6-28: DDTM 2040 Do Minimum, V/C Assessment, Dover Key Junctions, PM Peak 89

Figure 6-29: DDTM 2040 Do Minimum, V/C Assessment, Deal, AM Peak 90

Figure 6-30: DDTM 2040 Do Minimum, V/C Assessment, Deal, PM Peak 91

Figure 6-31: DDTM 2040 Do Something New Links 94

Figure 6-32: DDTM 2040 Do Something 1 No Mitigation – Do Minimum Flow Difference, Dover, AM Peak 95

Figure 6-33: DDTM 2040 Do Something 1 No Mitigation – Do Minimum Flow Difference, Dover, PM Peak 96

Figure 6-34: DDTM 2040 Do Something 1 No Mitigation - 2040 Do Minimum, Deal, AM Peak 97

Figure 6-35: DDTM 2040 Do Something 1 No Mitigation - 2040 Do Minimum, Deal, PM Peak 98

Figure 6-36: DDTM 2040 Do Something 1 No Mitigation - 2040 Do Minimum Flow Difference, Whitfield Roundabout, AM Peak 99

Figure 6-37: DDTM 2040 Do Something 1 No Mitigation - 2040 Do Minimum % Difference, Whitfield Roundabout, AM Peak 100

Figure 6-38: DDTM 2040 Do Something 1 No Mitigation - 2040 Do Minimum Flow Difference, Whitfield Roundabout, PM Peak 101

Figure 6-39: DDTM 2040 Do Something 1 No Mitigation - 2040 Do Minimum % Difference, Whitfield Roundabout, PM Peak 102

Figure 6-40: DDTM 2040 Do Something 1 No Mitigation - 2040 Do Minimum Actual Difference, DoY Roundabout, AM Peak 103

Figure 6-41: DDTM 2040 Do Something 1 No Mitigation - 2040 Do Minimum % Difference, DoY Roundabout, AM Peak 104

Figure 6-42: DDTM 2040 Do Something 1 No Mitigation - 2040 Do Minimum Actual Difference, DoY Roundabout, PM Peak 105

Figure 6-43: DDTM 2040 Do Something 2 No Mitigation – Do Minimum Flow Difference, Dover, AM Peak 106

Figure 6-44: DDTM 2040 Do Something 2 No Mitigation– Do Minimum Flow Difference, Dover, PM Peak 107

Figure 6-45: DDTM 2040 Do Something 2 No Mitigation - 2040 Do Minimum, Deal, AM Peak 108

Figure 6-46: DDTM 2040 Do Something 2 No Mitigation - 2040 Do Minimum, Deal, PM Peak 109

Figure 6-47: DDTM 2040 Do Something 2 No Mitigation - 2040 Do Minimum Flow Difference, Whitfield Roundabout, AM Peak 110

Figure 6-48: DDTM 2040 Do Something 2 No Mitigation - 2040 Do Minimum % Difference, Whitfield Roundabout, AM Peak 111

Figure 6-49: DDTM 2040 Do Something 2 No Mitigation - 2040 Do Minimum Flow Difference, Whitfield Roundabout, PM Peak 112

Figure 6-50: DDTM 2040 Do Something 2 No Mitigation - 2040 Do Minimum % Difference, Whitfield Roundabout, PM Peak 113

Figure 6-51: DDTM 2040 Do Something 2 No Mitigation - 2040 Do Minimum Actual Difference, DoY Roundabout, AM Peak 114

Figure 6-52: DDTM 2040 Do Something 2 No Mitigation - 2040 Do Minimum % Difference, DoY Roundabout, AM Peak 115

Figure 6-53: DDTM 2040 Do Something 2 No Mitigation - 2040 Do Minimum Actual Difference, DoY Roundabout, PM Peak 116

Figure 6-54: DDTM 2040 Do Something 2 No Mitigation - 2040 Do Minimum % Difference, DoY Roundabout, PM Peak 117

Figure 6-55: DDTM 2040 Do Something New Links 118

Figure 6-56: DDTM 2040 Do Something 1 with Mitigation – Do Minimum Flow Difference, Dover, AM Peak 119

Figure 6-57: DDTM 2040 Do Something 1 with Mitigation – Do Minimum Flow Difference, Dover, PM Peak 120

Figure 6-58: DDTM 2040 Do Something 1 with Mitigation - 2040 Do Minimum, Deal, AM Peak 121

Figure 6-59: DDTM 2040 Do Something 1 with Mitigation - 2040 Do Minimum, Deal, PM Peak 121

Figure 6-60: DDTM 2040 Do Something 1 with Mitigation - 2040 Do Minimum Flow Difference, Whitfield Roundabout, AM Peak 122

Figure 6-61: DDTM 2040 Do Something 1 with Mitigation - 2040 Do Minimum % Difference, Whitfield Roundabout, AM Peak 123

Figure 6-62: DDTM 2040 Do Something 1 with Mitigation - 2040 Do Minimum Flow Difference, Whitfield Roundabout, PM Peak 124

Figure 6-63: DDTM 2040 Do Something 1 with Mitigation - 2040 Do Minimum % Difference, Whitfield Roundabout, PM Peak 125

Figure 6-64: DDTM 2040 Do Something 1 with Mitigation - 2040 Do Minimum Actual Difference, DoY Roundabout, AM Peak 126

Figure 6-65: DDTM 2040 Do Something 1 with Mitigation - 2040 Do Minimum % Difference, DoY Roundabout, AM Peak 127

Figure 6-66: DDTM 2040 Do Something 1 with Mitigation - 2040 Do Minimum Actual Difference, DoY Roundabout, PM Peak 128

Figure 6-67: DDTM 2040 Do Something 1 with Mitigation - 2040 Do Minimum % Difference, DoY Roundabout, PM Peak 129

Figure 6-68: DDTM 2040 Do Something 1 with Mitigation - 2040 Do Minimum Actual Difference, London Road , AM Peak 130

Figure 6-69: DDTM 2040 Do Something 1 with Mitigation - 2040 Do Minimum % Difference, London Road, AM Peak 131

Figure 6-70: DDTM 2040 Do Something 1 with Mitigation - 2040 Do Minimum Actual Difference, London Road, PM Peak 132

Figure 6-71: DDTM 2040 Do Something 1 with Mitigation - 2040 Do Minimum % Difference, London Road Roundabout, PM Peak 133

Figure 6-72: DDTM 2040 Do Something 1 with Mitigation - 2040 Do Minimum Actual Difference, A256/ Deal Road, AM Peak 134

Figure 6-73: DDTM 2040 Do Something 1 with Mitigation - 2040 Do Minimum % Difference, A256/ Deal Road, AM Peak 135

Figure 6-74: DDTM 2040 Do Something 1 with Mitigation - 2040 Do Minimum Flow Difference, A256/ Deal Road, PM Peak 136

Figure 6-75: DDTM 2040 Do Something 1 with Mitigation - 2040 Do Minimum % Difference, A256/ Deal Road, PM Peak 137

Figure 6-76: DDTM 2040 Do Something 1 with Mitigation, V/C Assessment, Full Model Extent, AM Peak 138

Figure 6-77: DDTM 2040 Do Something 1 with Mitigation, V/C Assessment, Full Model Extent, PM Peak 139

Figure 6-78: DDTM 2040 Do Something 1 with Mitigation, V/C Assessment, Dover, AM Peak 140

Figure 6-79: DDTM 2040 Do Something 1 with Mitigation, V/C Assessment, Dover Key Junctions, AM Peak 141

Figure 6-80: DDTM 2040 Do Something 1 with Mitigation, V/C Assessment, Dover, PM Peak 142

Figure 6-81: DDTM 2040 Do Something 1 with Mitigation, V/C Assessment, Dover Key Junctions, PM Peak 143

Figure 6-82: DDTM 2040 Do Something 1 with Mitigation, V/C Assessment, Deal, AM Peak 144

Figure 6-83: DDTM 2040 Do Something 1 with Mitigation, V/C Assessment, Deal, PM Peak 145

Figure 6-84: DDTM 2040 Do Something 2 with Mitigation– Do Minimum Flow Difference, Dover, AM Peak 149

Figure 6-85: DDTM 2040 Do Something 2 with Mitigation– Do Minimum Flow Difference, Dover, PM Peak 150

Figure 6-86: DDTM 2040 Do Something 2 with Mitigation - 2040 Do Minimum, Deal, AM Peak 151

Figure 6-87: DDTM 2040 Do Something 2 with Mitigation - 2040 Do Minimum, Deal, PM Peak 151

Figure 6-88: DDTM 2040 Do Something 2 with Mitigation - 2040 Do Minimum Flow Difference, Whitfield Roundabout, AM Peak 152

Figure 6-89: DDTM 2040 Do Something 2 with Mitigation - 2040 Do Minimum % Difference, Whitfield Roundabout, AM Peak 153

Figure 6-90: DDTM 2040 Do Something 2 with Mitigation - 2040 Do Minimum Flow Difference, Whitfield Roundabout, PM Peak 154

Figure 6-91: DDTM 2040 Do Something 2 with Mitigation - 2040 Do Minimum % Difference, Whitfield Roundabout, PM Peak 155

Figure 6-92: DDTM 2040 Do Something 2 with Mitigation - 2040 Do Minimum Actual Difference, DoY Roundabout, AM Peak 156

Figure 6-93: DDTM 2040 Do Something 2 with Mitigation - 2040 Do Minimum % Difference, DoY Roundabout, AM Peak 157

Figure 6-94: DDTM 2040 Do Something 2 with Mitigation - 2040 Do Minimum Actual Difference, DoY Roundabout, PM Peak 158

Figure 6-95: DDTM 2040 Do Something 2 with Mitigation - 2040 Do Minimum % Difference, DoY Roundabout, PM Peak 159

Figure 6-96: DDTM 2040 Do Something 2 with Mitigation - 2040 Do Minimum Actual Difference, London Road, AM Peak 160

Figure 6-97: DDTM 2040 Do Something 2 with Mitigation - 2040 Do Minimum % Difference, London Road, AM Peak 161

Figure 6-98: DDTM 2040 Do Something 2 with Mitigation - 2040 Do Minimum Actual Difference, London Road, PM Peak 162

Figure 6-99: DDTM 2040 Do Something 2 with Mitigation - 2040 Do Minimum % Difference, London Road Roundabout, PM Peak 163

Figure 6-100: DDTM 2040 Do Something 2 with Mitigation - 2040 Do Minimum Actual Difference, A256/ Deal Road, AM Peak 164

Figure 6-101: DDTM 2040 Do Something 2 with Mitigation - 2040 Do Minimum % Difference, A256/ Deal Road, AM Peak 165

Figure 6-102: DDTM 2040 Do Something 2 with Mitigation - 2040 Do Minimum Flow Difference, A256/ Deal Road, PM Peak 166

Figure 6-103: DDTM 2040 Do Something 2 with Mitigation - 2040 Do Minimum % Difference, A256/ Deal Road, PM Peak 167

Figure 6-104: DDTM 2040 Do Something 2 with Mitigation, V/C Assessment, Full Model Extent, AM Peak 169

Figure 6-105: DDTM 2040 Do Something 2 with Mitigation, V/C Assessment, Full Model Extent, PM Peak 169

Figure 6-106: DDTM 2040 Do Something 2 with Mitigation, V/C Assessment, Dover, AM Peak 170

Figure 6-107: DDTM 2040 Do Something 2 with Mitigation, V/C Assessment, Dover Key Junctions, AM Peak 171

Figure 6-108: DDTM 2040 Do Something 2 with Mitigation, V/C Assessment, Dover, PM Peak 172

Figure 6-109: DDTM 2040 Do Something 2 with Mitigation, V/C Assessment, Dover Key Junctions, PM Peak 173

Figure 6-110: DDTM 2040 Do Something 2 with Mitigation, V/C Assessment, Deal, AM Peak 174

Figure 6-111: DDTM 2040 Do Something with Mitigation, V/C Assessment, Deal, PM Peak 175

Figure 6-112: DDTM 2040 Do Something 1 With Mitigation - Do something 1 No Mitigation, AM Peak 183

Figure 6-113: DDTM 2040 Do Something 1 With Mitigation - Do something 1 No Mitigation, PM Peak 184

Figure 6-114: DDTM 2040 Do Something 2 With Mitigation - Do something 2 No Mitigation, AM Peak 185

Figure 6-115: DDTM 2040 Do Something 2 With Mitigation - Do something 2 No Mitigation, PM Peak 186

Figure 7-1: Zones used for Fastrack Analysis 188

Figure 7-2: Fastrack Zones, Car Trips, AM Peak 189
Figure 7-3: Fastrack Zones, Car Trips, PM Peak 189
Figure 7-4: Difference in Flows between DS2 Fastrack and DS2, AM Peak 190
Figure 7-5: Difference in Flows between DS2 Fastrack and DS2, PM Peak 191
Figure 8-1: Proposed Junction Improvement at Alkham Valley Road Junction 208
Figure 8-2: Proposed Alkham Valley/ London Road Signalised Junction Drawing 209
Figure 8-3: Proposed Station Road/ A258/ Grams Road Signalised Junction Drawing 216
Figure 9-1: Count Locations 229
Figure 9-2: Master Clusters for External Sites 231

APPENDICES: Please see separate Appendix Report

Appendix A - Statement of Common Ground Appendix
Appendix B - Whitfield Roundabout
Appendix C - Duke of York Roundabout
Appendix D - Housing Completions
Appendix E - Employment Completions
Appendix F - Extant Housing Sites
Appendix G - Extant Employment Sites
Appendix H - TRICS Output
Appendix I - Committed Development Trip Generation
Appendix J - Local Plan Residential Allocations
Appendix K - Local Plan Employment Allocations
Appendix L - Do Something Trip Generation
Appendix M - National Highways Technical Note
Appendix N - Duke of York Triggerpoint Assessment
Appendix O - Feasibility of Signalised Junctions
Appendix P - Junction Modelling Outputs
Appendix Q - Excel Models - Observed Flows
Appendix R - Excel Models - Do Minimum Flows
Appendix S - Excel Models - Do Something Flows

Executive Summary

WSP were commissioned by Dover District Council (DDC) to undertake forecast transport modelling required to assess the Regulation 19 Local Plan proposals. The assessment of the potential allocations will provide DDC, Kent County Council (KCC) and National Highways (NH) evidence of the impacts that the Local Plan sites might have on the existing highway network and assist in identifying key locations or junctions that may require mitigation measures to support the Local Plan developments.

The purpose of this report is to document the details of the forecast modelling process used to assess the Dover Local Plan development sites. The report outlines the methodology used for the development of the forecast matrices and forecast networks, it also describes the details of the potential development sites modelled and their results.

This report outlines the potential site allocations which will feed into the 2040 Do Minimum and Do Something scenarios including the completed and committed developments and highway schemes, background growth and potential Local Plan sites. This forecasting report outlines the results for a Do Minimum and four Do Something scenarios, assessing the impact of a 2040 forecast year, with and without the Local Plan, with different levels of development at Whitfield Urban Expansion and with and without junction mitigation at Whitfield and Duke of York roundabouts.

Forecasting Approach

To assess the impacts of the Dover Local Plan sites, 2040 Do Minimum, Do Something 1 and Do Something 2 scenarios were developed to represent Dover District growth and development.

- **Do Minimum (DM)** scenario has been developed to include all completed and consented growth within Dover alongside committed infrastructure schemes;
- **Do Something 1 (DS1)** scenario that is based upon the Do Minimum scenario with the sites being taken forward to Regulation 19 for the Dover District Local Plan and 2,000 dwellings as part of Whitfield Urban Expansion (WUE);
- **Do Something 2 (DS2)** scenario that is based upon the Do Minimum scenario with the sites being taken forward to Regulation 19 for the Dover District Local Plan and 4,930 dwellings as part of WUE;

DS1 and DS2 have also been assessed with and without the Whitfield and Duke of York junction improvements. The 2040 Do Minimum and both Do Something forecast scenarios have been developed in VISUM 15, which was used to develop and validate the 2015 Dover and Deal Transport Model (DDTM) base model.

This report outlines the proposed assumptions which feed into the 2040 DDTM including the committed developments, which have been explicitly modelled, and the committed highway schemes.

It should be noted that the most recent DS scenario was developed prior to finalising the proposed employment and housing allocations in the Reg 19 Plan, and therefore does not match exactly the proposed allocations. Appendix A, in separate document explains the differences and it is agreed by the parties that at the current time the DS scenario provides a reasonable basis on which to assess the Reg 19 proposals.

Forecast Transport Infrastructure

DDC provided WSP with completed and forecast network changes up to Autumn 2021; for the purpose of the DDTM forecasting and assessment, transport highway infrastructure schemes which are completed, committed and any network changes associated with access arrangements for explicitly modelled developments have been incorporated in the forecasting models. The network changes incorporated in the forecasting model are discussed in greater depth in **Chapter 3**.

Forecast Demand

DDC provided a development uncertainty log to WSP which contained the uncertainty status of a series of housing and employment developments within the respective local authority detailing the committed housing and employment growth expected between the model year 2015 and the proposed forecast year, 2040. DDC provided the following information:

- **Completions**: housing and employment completions between 2015 and 2021; and
- **Extant Sites**: housing and employment sites with consented planning permission that are forecast to be delivered before 2040.

In the Do Minimum scenario, only those residential and employment sites with planning consent, and thus classified as ‘Near Certain’ using DfT TAG Guidance, are included. A list of all developments included within the Do Minimum scenario have been detailed in Appendix F and Appendix G, in separate document.

The net increase of dwellings and jobs have been provided to WSP by DDC and are split into completions between 2015 to 2021, and extant sites with planning permission forecast to be build out before the forecast year of 2040; the modelled development included in the Do Minimum is summarised in Table 1.

Table 1: Dover Authority Housing and Job Growth Predictions (DM Scenario)

Housing Growth Origin	Net Increase Dwellings	Net Increase Jobs
Completions 2015 to March 2021	2,852	369
DDC March 2021 to 2040 Extant sites with Planning Permission	5,063	2,407
Total	**7,915**	**2,776**

For the Do Minimum scenario, TEMPro background growth has not been applied within Dover district and instead the sole growth within Dover is from the completions and consented sites. TEMPro growth has been applied to zones outside of the Dover district boundary.

LOCAL PLAN ASSESSMENT

Do Something Scenarios

The Do Something Local Plan assessment has been developed using the Do Minimum scenario as a base and adding on projected growth from site allocations, provided by DDC. The trip generation associated with the housing and employment allocations likely to come forward in the Local Plan are the only changes between the 2040 Do Minimum scenario and Do Something scenario.

Table 2 summarises the net housing and employment in the Do Something scenarios.

Table 2: Net Housing and Employment, Do Something vs Do Minimum

	Net Dwellings	Net Jobs	Net SQM
Local Plan Sites (DS1)	7,195	4,591	95,604
Local Plan Sites (DS2)	10,125	4,591	95,604

Modelling the Do Something scenario allows for comparison against the Do Minimum assignments for conclusions to be drawn as to whether mitigation on the existing highway network might be necessary and assist in identifying locations where this may be the case.

Additional network detail has been incorporated into the Do Something scenario to reflect the proposed access location for the Local Plan allocations and to represent highway changes associated with Connaught Barracks and Whitfield Urban Expansion. In summary, these changes included the stopping up of Dover Road north of Castle Hill Road, the inclusion of Whitfield Urban Expansion development road, A2 at-grade roundabout with a northbound priority lane and a new junction on the A256. More details of these changes are outlined in Chapter 3.

Table 3: Total Housing and Employment, Do Something Scenario

Do Something Scenario	Total Dwellings	Total Jobs	Total SQM
Completions 2015 -2020	2,852	369	37,227
Extant Planning Permission	5,063	2,407	114,786
Local Plan Sites (DS1)	7,195	4,591	95,604
Local Plan Sites (DS2)	10,125	4,591	95,604
Total (DS1)	**15,110**	**7,367**	
Total (DS2)	**18,040**	**7,367**	

DS1 and DS2 have been run with and without the Whitfield and Duke of York junction improvements to understand the impact they have with the Regulation 19 Local Plan proposals.

Results

This report discusses and presents the impacts of completed and consented growth, comparing the 2040 Do Minimum to the 2015 DDTM Base, and the impacts of the Regulation 19 proposed Local Plan sites, comparing the 2040 Do Something Scenarios against the Do Minimum. A volume over capacity assessment was undertaken on links and junctions to further understand the level of impacts experienced, and whether these are beneficial or adverse. A summary table demonstrating links and nodes with a V/C exceeding 85% is shown in Table 5. If there is an exceedance of 85% the text is coloured orange, if the performance is over 100% the text is coloured red.

A sensitivity test was undertaken to understand the impacts of potential mode shift from car to Dover Fastrack. This showed a reduction in traffic around Whitfield and key roads between Whitfield and Dover town centre, there were some reductions in traffic demand at junctions as a result of the Dover Fastrack.

Table 4: Links/ Nodes Exceeding 85% V/C (in at least one scenario or time period)

Network Location within DDTM Study Area		Do Minimum		Do Something 1		Do Something 2	
		AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
Link	A256 Whitfield Hill Southbound from Whitfield roundabout	64	69	44	84	44	86
	A256 Whitfield Hill / London Road roundabout	77	88	78	82	80	79
	A256 Whitfield Hill roundabout / London Rd roundabout; Circulatory Arm	58	84	61	91	62	94
	A258 Deal Road Southbound; Approach to DoY, north of The Lane	74	48	98	50	103	54
	A258 Northbound, North of Church Street Junction to Granville/ Salisbury Road	63	74	73	86	79	87
	Whitfield Development Road from Sandwich Road to A256 roundabout, Eastbound			9	33	80	94
	Honeywood Parkway roundabout; Circulatory Arm	65	44	48	73	48	91
	Honeywood Parkway Westbound; west of Honeywood Close	55	46	52	69	52	87
	Honeywood Parkway/ Fitness Field roundabout; Eastbound Exit	20	38	31	80	31	89
	Honeywood Parkway Eastbound	20	38	31	80	31	89
	Honeywood Parkway/ B&Q roundabout Circulatory	38	64	51	82	56	87
	Honeywood Parkway/ Fitness Fields; Circulatory Arm	21	38	32	81	32	90
	A258 London Road, North of Mongeham Way Junction	90	65	92	72	94	72
	A258 London Road Northbound	95	61	95	68	97	69
	A258 London Road/ Manor Road Roundabout; Circulatory Arm	108	72	109	80	113	80
	A258 London Road/ Manor Road Roundabout; Circulatory Arm	94	74	95	79	96	79
	Northern part of London Road / Manor Road roundabout	81	86	84	88	89	87
	Castle Hill Road/ St James Street SB	75	114	72	125	61	110
	Dover Road Southbound, South of Hawksdown Junction	72	45	91	48	93	53
	Biggin Street Westbound between Worthington Street and Priory Street	69	74	82	92	81	104
	Priory Street Southbound - Towards roundabout	61	69	74	87	73	97
	Castle Street Westbound, South of Maison Dieu Road	80	61	83	65	86	60
	Folkestone Rd Eastbound - Approaching A256 York St/ Priory Road roundabout	81	83	87	92	92	94
	A2 Eastbound, Coldred	72	70	59	76	74	96
Node	Whitfield Roundabout, A2 West Approach	94	98	96	93	100	94
	Whitfield Roundabout, Whitfield Hill Approach	99	100	103	105	102	107
	Whitfield Roundabout, Sandwich Road Approach	103	103	116	102	112	95
	Whitfield Roundabout, A2 East Approach	100	87	91	96	91	98
	Whitfield Roundabout, Honeywood Road Approach	85	89	82	94	85	98
	Duke of York roundabout - A2 West Approach	105	101	95	98	95	100
	Duke of York roundabout - A2 Jubilee Way Approach	90	99	91	95	92	97
	Duke of York roundabout - A258 Deal Road North Approach	105	68	99	61	98	62
	Duke of York roundabout - A258 Deal Road South Approach	84	105	101	109	99	108
	A256 / A2 Northern Roundabout; Northbound Approach	39	60	52	100	55	104
	A256 / A2 Northern Roundabout; Southbound approach	85	50	114	74	115	85
	A2 Eastbound onslip from A256/ A2 Northern roundabout	72	55	110	85	109	91
	A256/ A2 Southern Roundabout; Northbound Approach from Honeywood Parkway	17	31	27	80	28	86
	Whitfield Development Roundabout at NE of Site tying in at A256; Western Approach			49	82	81	86
	Western Approach to proposed roundabout on A2 leading to Whitfield Access Road.			58	76	56	97
	A265/ Richmond Way Roundabout, A256 Northbound Approach	45	77	59	106	61	107
	A20 Limekiln Street/ Union Street Signalised junction	88	74	91	72	97	72
	A20 Limekiln Street/ Snargate Street /Union Street Signalised Junction	84	70	86	69	85	69
	Castle Street/ Maison Dieu Road Signalised junction	82	95	81	85	85	84
	A20 Snargate St/ York St Signalised Junction	70	78	85	89	84	89
	A20 Snargate St/ York St Signalised Junction	74	81	89	93	88	93
	A256 Maison Dieu / Park Avenue / Godwyne Road / Park Street Signalised Junction	68	82	86	49	68	86
	London Road / Alkham Valley Road Junction	59	61	86	61	89	73
	Dover Road/ Boys Hill Roundabout, A256 North Approach	95	62	107	63	113	65
	A256 Dover Road/ Dover Road Roundabout, A256 Dover Road NE Approach	75	46	86	49	87	51

Strategic models are useful in indicating locations where capacity constraint might occur. DDC discussed these locations with KCC and NH and agreed that local junction modelling was undertaken at the following junctions:

- Whitfield roundabout
- Duke of York roundabout
- A256/A2 dumbbell,
- London Road/ Alkham Valley Road
- A256/ Boys Hill roundabout
- A258/ Station Road/ Grams Road

Local Junction Models

Following a review of the highway impacts of the Do Minimum and Do Something scenarios, a more detailed junction modelling exercise have been undertaken at the following key junctions detailed above.

With the junction models WSP are further able to determine a more accurate picture of the likely operation of the junctions in the forecast scenarios and help to determine suitable mitigation for these junctions if they are exceeding capacity in the Do Minimum scenario and the problem is further exacerbated with the implementation of the local plan developments.

The detailed junction modelling has identified junction improvements at both Whitfield and Duke of York roundabouts which have been agreed with KCC and NH. The junction modelling at A256/ Boys Hill roundabout identified that the impacts of the Local Plan are minimal, and no improvements are required. Again this has been agreed with NH and KCC. The junction modelling at the A256/ A2 dumbbell undertaken following comments from NH in October 2022 indicate the Honeywood Parkway arm becomes over capacity in the PM peak as a result of the White Cliffs Business Park development. At London Road/ Alkham Valley Road and A258/ Station Road/ Grams Road potential improvements have been identified and modelled but need to be further discussed with KCC. At the A256/ A258 and A256/ A257/ Ash Road junctions capacity issues have been identified and potential solutions need to be discussed with KCC.

EXTERNAL LOCAL PLAN SITES

Proposed Local Plan sites that are situated outside of the DDTM Study Area have been assessed in excel models, developed using 2019 observed count data and growth factors from the 2040 Do Minimum models. Trip generation was undertaken using agreed trip rates and the trips were distributed using 2011 Census Journey to Work data, further details on trip rates and the aggregation of the sites into clusters can be found in Chapter 8.

Flow diagrams have been produced to represent the Do Something network outside of the study area and growth between the Do Something 1 and Do Minimum has been presented for each link and turning movement. The excel modelling exercise demonstrated that the junctions in Table 5 are forecast to experience the most significant increases in vehicle volumes.

Table 5: External Local Plan Allocations, Junction Impacts, Do Something 1 vs Do Minimum

	AM Peak		PM Peak	
	Actual Difference	% Difference	Actual Difference	% Difference
A257 High Street / Harrison Rd / B2046 High Street / A257 Canterbury Rd	128	7.06%	221	10.62%
B2046 Adisham Rd / Dorman Avenue	90	6.89%	96	5.69%
B2046 Adisham Rd / Spinney Lane	273	17.87%	249	15.30%
A257 / Sandwich Bypass / Ash Rd	242	6.60%	315	8.98%
Ramsgate Rd / Sandwich Bypass	191	5.50%	246	6.88%
A256 Sandwich Bypass / A258 Deal Rd / A256 (S)	-41	-1.53%	219	8.60%
A258 Deal Road W / E / S	-3	-1.46%	137	6.61%
High Street / Church Street / Brooke Street / Lower Street	99	23.52%	108	29.92%
Wigmore Lane / Shooters Hill / Shepherdswell Rd / Church Hill	234	32.19%	305	48.34%
A260 Canterbury Rd / Alkham Valley Rd	137	4.95%	220	9.12%

Summary

Overall, this report outlines the impacts of Regulation 19 Local Plan development proposals in Dover and presents both the strategic modelling and the detailed junction modelling work undertaken to assess the impacts and identify mitigations to alleviate highway capacity constraints. This work has been undertaken in close collaboration with both KCC and NH to ensure agreement at each stage of the process. It is envisaged this close collaboration will continue to ensure the successful delivery of the Local Plan and the associated junction improvements which will be required to deliver the growth identified.

Next Steps

The next steps for this work will be to agree the outstanding junction requirements with KCC and NH. It will also be important to continue to progress the Whitfield and Duke of York roundabout improvements taking them to Road Safety Audit Stage 1.

1

Introduction

PUBLIC

1 Introduction

1.1 Introduction

1.1.1. WSP were commissioned by Dover District Council (DDC) to undertake forecast transport modelling required to assess the Local Plan proposals. The assessment of the allocations will provide DDC and Kent County Council (KCC) evidence of the impacts that the Regulation 19 Local Plan sites will have on the existing highway network, specific junctions and assist in identifying potential mitigation measures required to support the allocations.

1.1.2. The Dover and Deal Transport Model (DDTM) was developed using the PTV VISUM software and is based on the 2015 Dover Transport Model (DTM) which has been agreed by National Highways (NH) and KCC as being 'fit for purpose'. The DDTM enhances the model within the Deal area and as part of the model refinement process, additional observed data was collected within Deal and matched within the base year model. The LMVR report concluded that following the localised calibration and validation of the DDTM model provides a robust basis from which to create forecast models and assignment for the Dover Local Plan proposals. KCC and NH also confirmed that the model was 'fit for purpose' as a base for forecast assessments.

1.1.3. WSP have undertaken model analysis, for both the AM and PM peak, of the transportation impacts of delivering housing proposals associated with the Dover District Council Local Plan using a 2040 DDTM forecast model.

1.1.4. A Do Minimum assessment has been developed to determine the impacts in a forecast scenario in which committed developments and infrastructure are delivered, but without the Local Plan proposed site allocations.

1.1.5. A Do Something scenario has been development to consider the impacts of the Local Plan sites in addition to the consented growth.

1.1.6. This report details the background information of the DDTM, the forecast methodology which has been agreed with DDC, KCC and NH for undertaking this assessment and presents the impacts on the highway network of the Do Minimum (DM) and two potential Do Something (DS) scenarios.

1.2 Model Extent

1.2.1. The DDTM has a base year of 2015 based on an average Monday to Thursday for neutral months. The following time periods have been modelled:

- AM peak hour (0800-0900); and
- PM peak hour (1700-1800).

1.2.2. The DDTM Study Area is shown in Figure 1-1; this represents the area of detailed modelling and links within the simulation area. Areas outside the red boundary are modelled in considerably less detail.



Figure 1-1: DDTM Study Area

1.3 Model Scenarios

1.3.1. The Do Minimum model scenario was created based on the validated base networks, that consider the schemes completed between 2015-2021 and consented schemes forecast to be built out before 2040. The Do Minimum scenario includes the trip generation from an increase of approximately 2,776 jobs and 7,915 dwellings between 2015 and 2040.

1.3.2. WSP have assessed two Do Something scenarios, consisting of potential housing and employment site allocations being taken forward as part of Regulation 19 for the Local Plan and developed based upon information on the location and development quantum of the potential housing and employment site allocations provided by DDC. Within the Dover district, the potential allocations are the only housing and employment growth expected between 2040 Do Minimum scenario and the 2040 Do Something scenario.

1.3.3. The Do Something 1 scenario includes development trips generated by the inclusion of approximately 7,195 dwellings and 4,591 jobs across approximately 95,604sqm of employment space. The Do Something 2 scenario includes the development trips generated by the inclusion of approximately 10,125 dwellings and 4,591 jobs. The difference between the two Do Something scenarios are the total number of dwellings assumed at Whitfield (2,000 and 4,930 dwellings respectively).

1.3.4. Table 1-1 shows the total number of houses and job assumed for both the Do Minimum and the Do Something. It should be noted that the Do Something dwelling and job totals are in addition to those captured in the Do Minimum scenario.

1.3.5. It should be noted that as the most recent DS scenario was developed prior to finalising the proposed employment and housing allocations in the Reg 19 Plan, and therefore does not

match exactly the proposed allocations. Appendix A, in separate document, explains the differences and it is agreed by the parties that at the current time the DS scenario provides a reasonable basis on which to assess the Reg 19 proposals.

Table 1-1: 2040 Dwellings and Jobs by Scenario

Scenario	Dwellings	Jobs
2040 Do Minimum	7,915	2,776
2040 Do Something 1	15,110	7,367
2040 Do Something 2	18,040	7,367

1.3.6. The sites proposed within the Local Plan, as well as their access arrangements and specific trip generation, have been presented in detail within Chapter 5. The impacts of including the potential site allocations are presented in Chapter 6 where flow increases at key junctions within Dover and Deal are discussed.

1.4 Purpose of the Report

1.4.1. The purpose of this report is to document the details of the forecast modelling process used to assess the Dover Local Plan development sites. The report outlines the methodology used for the development of the forecast matrices and forecast networks, it also describes the details of the proposed developments modelled and their results. The analysis within this Forecasting Report has been undertaken and presented to support DDC's Regulation 19 Local Plan which will be consulted on for 7 weeks between October and December 2022.

1.4.2. This forecasting report outlines the methodology and results for a Do Minimum and Do Something, explained in detail within Chapter 2 and summarised below:

- **Do Minimum (DM)** scenario has been developed to include all completed and consented growth within Dover alongside committed infrastructure schemes, as at 31st March 2021;
- **Do Something 1 (DS1)** scenario that is based upon the Do Minimum scenario with the sites being taken forward to Regulation 19 for the Dover District Local Plan and 2,000 dwellings as part of Whitfield Urban Expansion (WUE);
- **Do Something 2 (DS2)** scenario that is based upon the Do Minimum scenario with the sites being taken forward to Regulation 19 for the Dover District Local Plan and 4,930 dwellings as part of WUE;

1.4.3. This report outlines the proposed assumptions which will feed into the 2040 DDTM including the committed developments, which will be explicitly modelled, and the committed highway schemes.

1.5 Summary of the Forecasting Process

1.5.1. To assess the Local Plan potential allocations, it was necessary to build demand trip matrices in relation to the forecast year 2040 for the Do Minimum and Do Something. These have been determined using the following:

- **Committed Developments** – these were informed by Uncertainty logs provided to WSP by DDC;
- **Car Background Growth** – provided by National Trip End Model (NTEM) 7.2 growth factors, with committed development housing and employment removed to avoid double counting;
- **2018 National Road Traffic Forecasts** (RTF) – inform the Light Goods Vehicle (LGV) and Heavy Goods Vehicle (HGV) forecast growth; and
- **Port of Dover Growth** – Growth levels agreed with Port of Dover, presented in greater detail in Chapter 4.

1.5.2. The committed development, car background growth, 2018 National Road Traffic Forecast growth and Port of Dover growth are consistent between the Do Minimum and Do Something scenarios. The only difference therefore between the Do Something and Do Minimum is the inclusion of Local Plan allocation and associated infrastructure.

1.5.3. To inform the assessment of the DDTM, forecast networks were developed that included committed infrastructure schemes assumed to be delivered between the 2015 model base year and 2040. The development of the forecast networks is discussed within Chapter 3. The methodology for developing forecast matrices, along with site specific trip generation for consented applications within Dover District and the inputs used, is discussed within Chapter 4.

1.5.4. Network changes related to the potential Local Plan allocations and associated development, are presented in Chapter 5. The forecasting methodology for assessing the proposed schemes, such as the infrastructure at WUE, was agreed with DDC prior to finalising the transport modelling.

1.6 Structure of Report

1.6.1. The purpose of this report is to summarise the work carried out by WSP in the development of the 2040 Do Minimum and Do Something DDTM forecast models and to assess the implementation of the Regulation19 site allocations within the Local Plan. This report is structured as follows:

- **Chapter 2**: Forecast Approach;
- **Chapter 3**: Forecast Transport Infrastructure;
- **Chapter 4**: Forecast Demand;
- **Chapter 5**: Local Plan Assessment;
- **Chapter 6**: Results;

- **Chapter 7:** Sensitivity Tests;
- **Chapter 8**: Local Junction Modelling Assessment;
- **Chapter 8**: External Site Assessment; and
- **Chapter 9**: Recommendations

2

FORECASTING APPROACH

PUBLIC

2 Forecasting Approach

2.1 Introduction

2.1.1. Forecast modelling consists of two core elements: forecast supply (transport infrastructure) and forecast demand. This section outlines the elements common to supply and demand, and the overall forecast approach taken.

2.1.2. The methodology adopted for developing the forecast models is as follows:

- Obtain information on local committed developments and transport infrastructure schemes within Dover District, and compile in an uncertainty log;
- Agree the network and matrix assumptions for the Do Something (Outlined in Chapter 5);
- Prepare Forecast Transport Infrastructure (Outlined in detail in Chapter 3); and
    - Develop Do Minimum network, based on validated base networks, that take account of schemes completed between 2015-2020 and consented schemes forecast to be built out before 2040;
    - Develop Do Something network, based on validated base networks, that take account of completed and committed transport infrastructure in the uncertainty log as well as the transport infrastructure associated with the Regulation 19 proposed Local Plan site allocations.
- Prepare Forecast Highway Demand (Outlined in detail in Chapter 4).
    - Develop Do Minimum matrices, based on validated base matrices, that take account of completed and consented developments in the uncertainty log, adjusted background growth taken from the National Trip End Model (NTEM) and the National RTFs in addition to Port specific growth; and
    - Develop Do Something matrices, based on Do Minimum matrices and adding on the trip generation associated with the Regulation 19 proposed Local Plan site allocations.

2.1.3. It is noted that the primary difference between the forecast highway demand in the Do Minimum and Do Something is the inclusion of the Regulation 19 proposed Local Plan allocations. A comparison between all scenarios is presented within Chapter 5.

2.2 Forecast Year

2.2.1. A single forecast year has been developed to assess the impact of the potential Local Plan site allocations. A forecast year of 2040 has been developed for the Do Minimum and Do Something.

2.3 Forecast Scenarios

2.3.1. This section outlines the elements common to supply and demand, and the overall forecast approach taken.

2.3.2. The approach considers the following for the three scenarios:

- **Do Minimum** scenario considers the completions between 2015-2021 and the consented developments to be built out before 2040 within Dover and applies National Trip End Model (NTEM) background growth for Cars and National Road Traffic Forecast (NRTF) growth for LGVs and HGV; background growth is applied outside of the Dover district boundary only.
- **Do Something 1 (DS1)** scenario considers the Do Minimum scenario + Regulation 19 proposed Local Plan site allocations, assuming 2,000 dwellings WUE
- **Do Something 2 (DS2)** scenario considers the Do Minimum scenario + Regulation 19 proposed Local Plan site allocations, assuming 4,930 dwellings WUE

2.3.3. The methodology adopted for developing the forecast models is as follows:

- Obtain information on local committed developments and infrastructure schemes within Dover District and compile in an uncertainty log;
- Prepare Forecast Transport Infrastructure (Outlined in detail in Chapter 3);
- Prepare Forecast Highway Demand (Outlined in detail in Chapter 4); and
- Process the network and matrix assumptions for assessing the potential Local Plan allocations and associated infrastructure (Outlined in Chapter 5).

2.4 Completions and Consented Development

2.4.1. DDC provided a development uncertainty log to WSP which contained the uncertainty status of a series of housing and employment developments. These represent proposed developments sites with planning permission, and thus ‘Near Certain’ development forecast to be built out by 2040.

2.4.2. The DDTM represents a 2015 base year and so it is important to first consider housing and employment developments that have been built out between 2015 and 2021 when calculating forecasting trip generation associated with completed or committed developments. DDC provided WSP with a comprehensive list of housing development completions which was the latest available information at the time of model development.

2.4.3. DDC also provided WSP with a list of employment completions, by location and area (sqm), since 2015. The number of jobs has been calculated by WSP using the employment sqm information provided and applying the Employment Density Guide (November 2015, produced by Home and Communities Agency), these conversion rates are shown in Table 2-1. This shows, for A1 for example, that there is 1 employee for every 18sqm of retail space.

Table 2-1: Employment Density Matrix

Land Use		1 Employee per Density (sqm)	Notes
A1	Retail	18	Net Internal Area (NIA)
A2	Finance & Professional Services	16	NIA
A3	Restaurants & Cafes	18	NIA
B1a	General Office	12	NIA
B1b	Retail & Dining Space	50	NIA
B1c	Light Industrial	47	NIA
B2	Industrial & Manufacturing	36	Gross External Area (GEA)
B8	Storage & Distribution	77	GEA
C1	Hotels	2	per bed
D2	Leisure	70	Gross Internal Area (GIA)
SG	Sui Generis	60	GEA

2.4.4. Housing and employment sites with planning permission have been included as part of the committed developments within the forecast matrices as they are consented and thus committed developments. Their full build out quantum and trajectory were provided to WSP by DDC; where the information was readily available, trips rates were extracted from the development Transport Assessment's and will be used to calculate the unique trip generation associated with these sites.

2.4.5. The number of jobs in each extant site with planning permission has been calculated using the Employment Density guide, shown in Table 2-1.

2.4.6. In addition to development information, WSP were provided with a committed infrastructure log that detailed consented schemes to be included within the forecast network coding. The application of this information is discussed within more detail in Chapter 3, Forecast Transport Infrastructure The building of forecast matrices, incorporating residential and commercial information from the DDC uncertainty log, has been discussed in detail within Chapter 4, Forecast Demand.

2.4.7. Thresholds based on development quantum were applied to each of the site locations to determine how the development would be modelled within the DDTM forecast scenarios; this is summarised in Table 2-2. The approach means small developments are included within the background growth and larger developments are directly related to the model zone system.

Table 2-2: Modelled Development Classification

Development quantum	Approach taken
0 – 99 dwellings / jobs	Trip generation associated with these developments in added to the existing DDTM polygon zone within which it is proposed to be located
100 + 499 dwellings / jobs	Development is explicitly modelled; trip generation is allocated a unique representative zone with proposed access arrangements coded into the forecast networks.

2.4.8. For the purposes of building the Do Minimum and Do Something scenarios and as a result of discussions with DDC, KCC and NH, it is considered that sites with a combined completed and extant total, for all land uses, of more than 100 households or jobs should be explicitly modelled. These developments are likely to have the largest scale of impact and therefore should be modelled in more detail by considering the proposed network access arrangements, mitigation, and internal site layout where appropriate. Highway network detail associated with explicitly modelled developments is described in more detail in Chapter 3, Forecast Transport Infrastructure; trip generation associated with all developments is presented in Chapter 4, Forecast Demand.

2.5 Tempro Growth

2.5.1. The projected housing and job growth expected between 2015 and 2040 as extracted from NTEM 7.2 is summarised in Table 2-3. Following guidance from NH, the Do Minimum reflects only inclusion of growth from committed developments and all background growth has been removed from within Dover District. It is important to note that NTEM 7.2 was the latest NTEM dataset available at the time the modelling work was undertaken, in early 2022. Subsequently NTEM 8 has been issued as Draft guidance but is not expected to be adopted as full guidance until November 2022.

Table 2-3: TEMPro Housing and Job Growth Targets

Net Growth (2015 - 2040)	TEMPro Growth Targets		Do Minimum Actual Growth	
	Households	Jobs	Households	Jobs
Dover	16,731	4,950	6,752	5,013
Kent*	172,064	78,080	172,064	78,080
South East**	752,113	380,240	752,113	380,240

*Excluding Dover, **Excluding Kent

2.6 Generalised Cost Components

2.6.1. The DfT TAG Databook (November 2021) provided suitable values of time (VOT) and vehicle operating costs (VOC) to calculate cost function coefficients for different vehicle types.

2.6.2. Table 2-4 shows the VOT and VOC values used for each TAG trip purpose, time of day, and modelled year. These were derived from the TAG data book.

Table 2-4: Generalised Cost Parameters, 2040

Demand segment	AM peak		PM peak	
	Time	Distance	Time	Distance
Car	42.97	0.51	41.8	0.49
LGV	48.4	1.2	48.4	1.2
HGV	110.96	3.3	110.97	3.3

2.7 Visum Version

2.7.1. The 2040 Do Minimum and Do Something forecast scenarios have been developed in VISUM 15, which was used to develop and validate the 2015 DDTM base model.

3

FORECAST TRANSPORT INFRASTRUCTURE

PUBLIC

3 Forecast Transport Infrastructure

3.1 Introduction

3.1.1. This chapter outlines the highway network changes that were incorporated into the DDTM forecast networks which were received in uncertainty logs provided by DCC and represent both proposed transport infrastructure schemes and development accesses incorporated for sites that are being explicitly modelled.

3.2 Committed Transport Infrastructure Schemes

3.2.1. For the purpose of the DDTM forecasting and assessment, transport highway infrastructure schemes which are committed and are associated with explicitly modelled developments will be incorporated in the forecasting models.

3.2.2. This section outlines the highway network that will be incorporated into the 2040 DDTM highway networks.

A20 Improvement Scheme

3.2.3. This scheme consists of junction improvements on the A20 at the Prince of Wales and York Street roundabouts (Phase 1 and Phase 2, respectively). These improvements have been completed since the 2015 DDTM was completed and as such will need to be incorporated into the 2040 forecast networks.

3.2.4. Microprocessor Optimised Vehicle Actuation (MOVA) Smart system traffic lighted junctions have been introduced and the access to Union Street have been improved. The traffic light control system for Woolcomber Street has also been upgraded.

3.2.5. Phase 1 is illustrated in Figure 3-1 and Phase 2 is illustrated in Figure 3-2. The coding for these junctions will also be based on checks using Google Street View, where updated information is available.

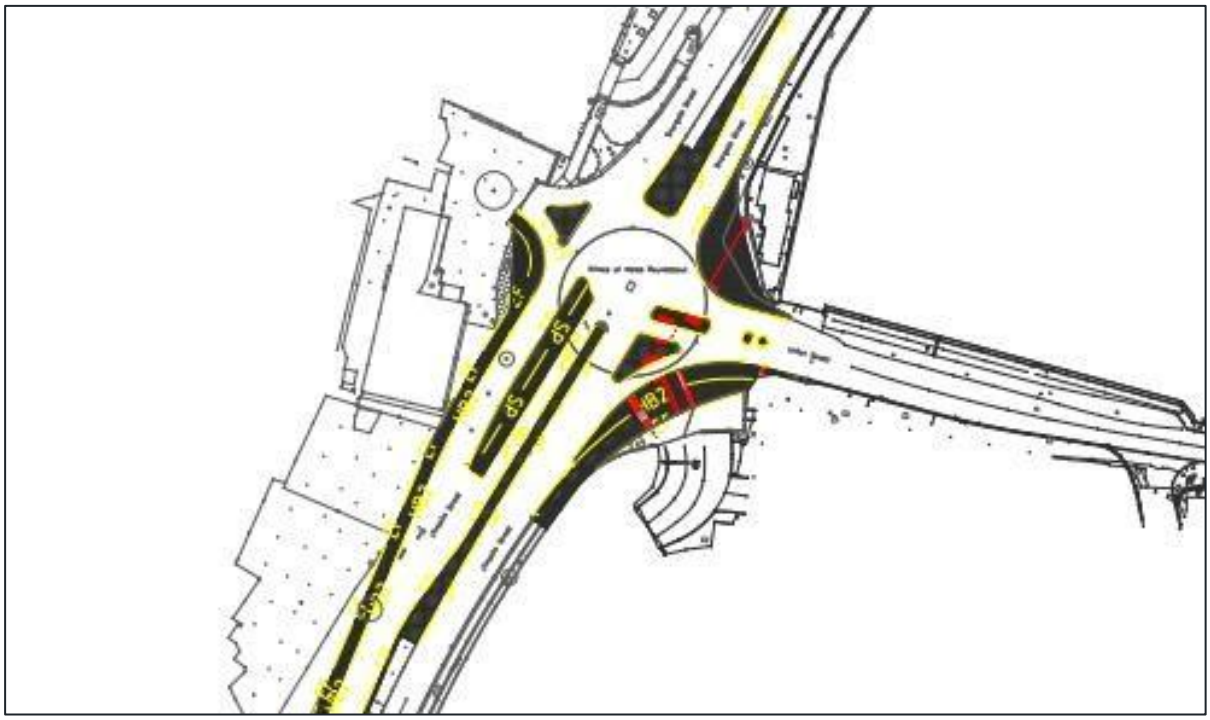


Figure 3-1: Prince of Wales Junction Improvements

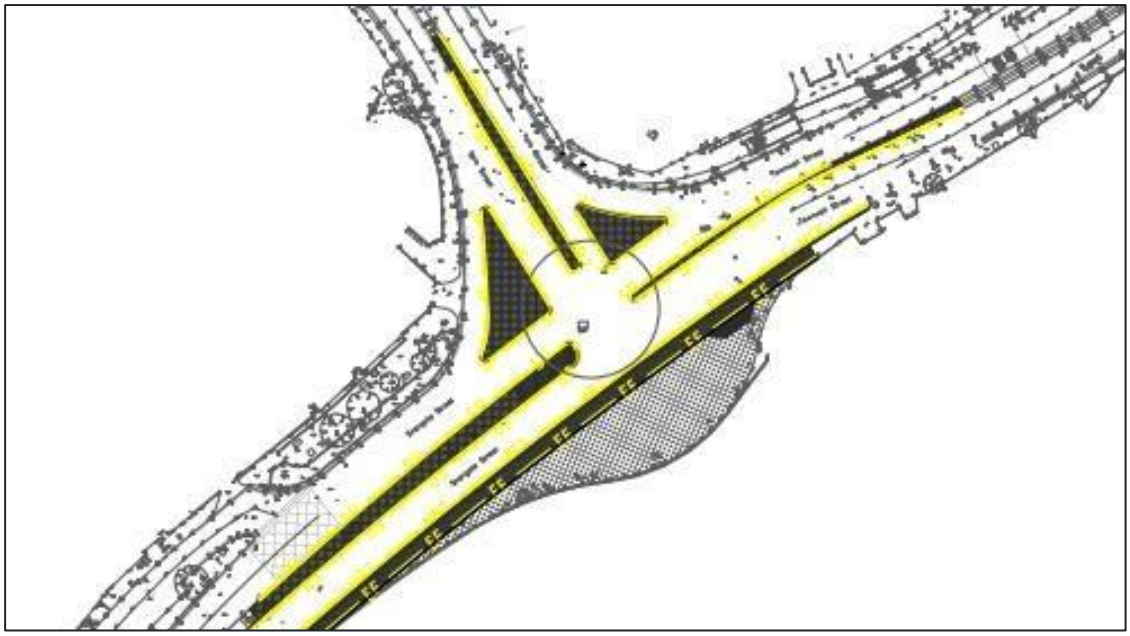


Figure 3-2: York Street Roundabout Junction Improvements

Proposed Link Road, Albert Road

3.2.6. A new link road with Albert Road is proposed, as shown in Figure 3-3.

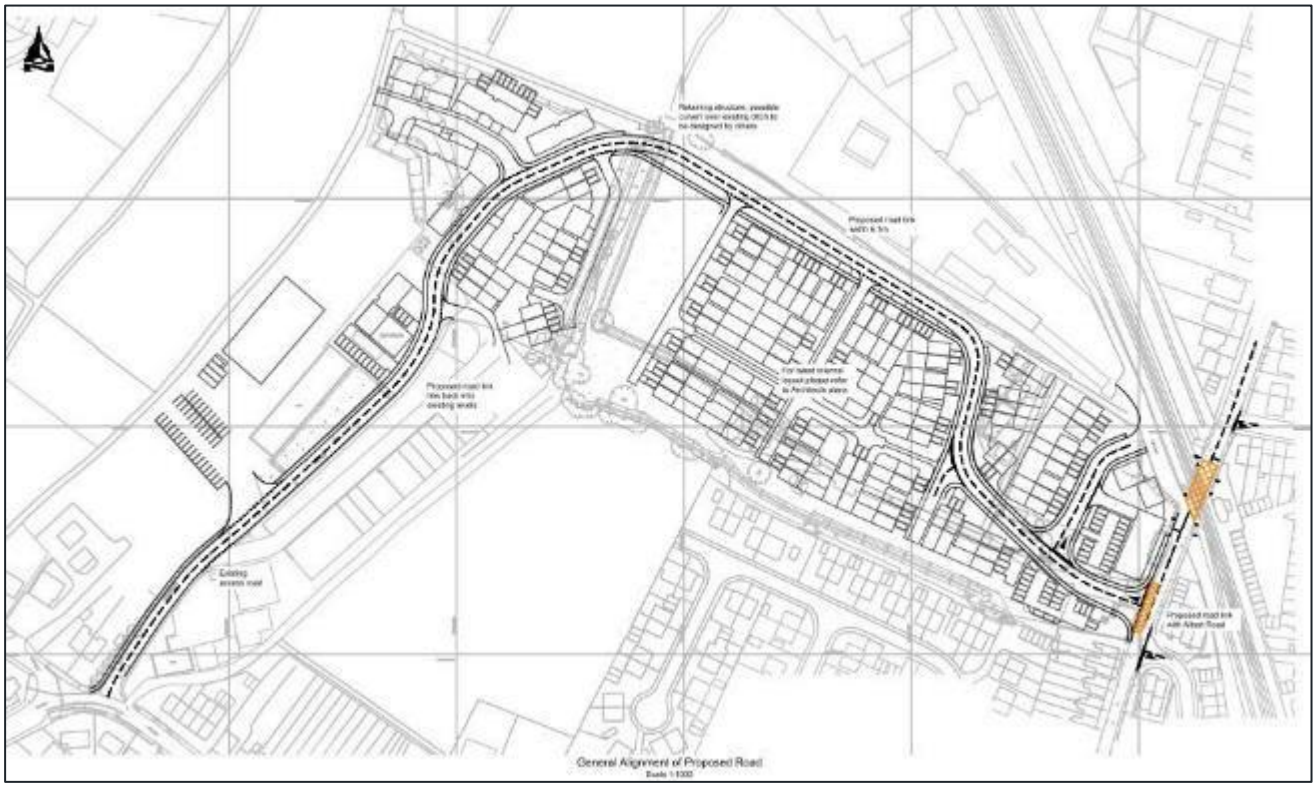


Figure 3-3: Proposed Link Road, Albert Road

Land between Deal & Sholden

3.2.7. The development proposals at Church Lane, between Deal and Sholden were coded into the model in accordance with Google Maps and Overall Site Plan found against the consented application number on the Dover Planning Portal and shown in Figure 3-4.



Figure 3-4: Church Lane Development Layout

Land on the west side of Albert Road, Deal

3.2.8. The development proposals on the west side of Albert Road in Deal were coded into the model in accordance with the Proposed Road Layout found against the consented application number on the Dover Planning Portal and shown in Figure 3-5.

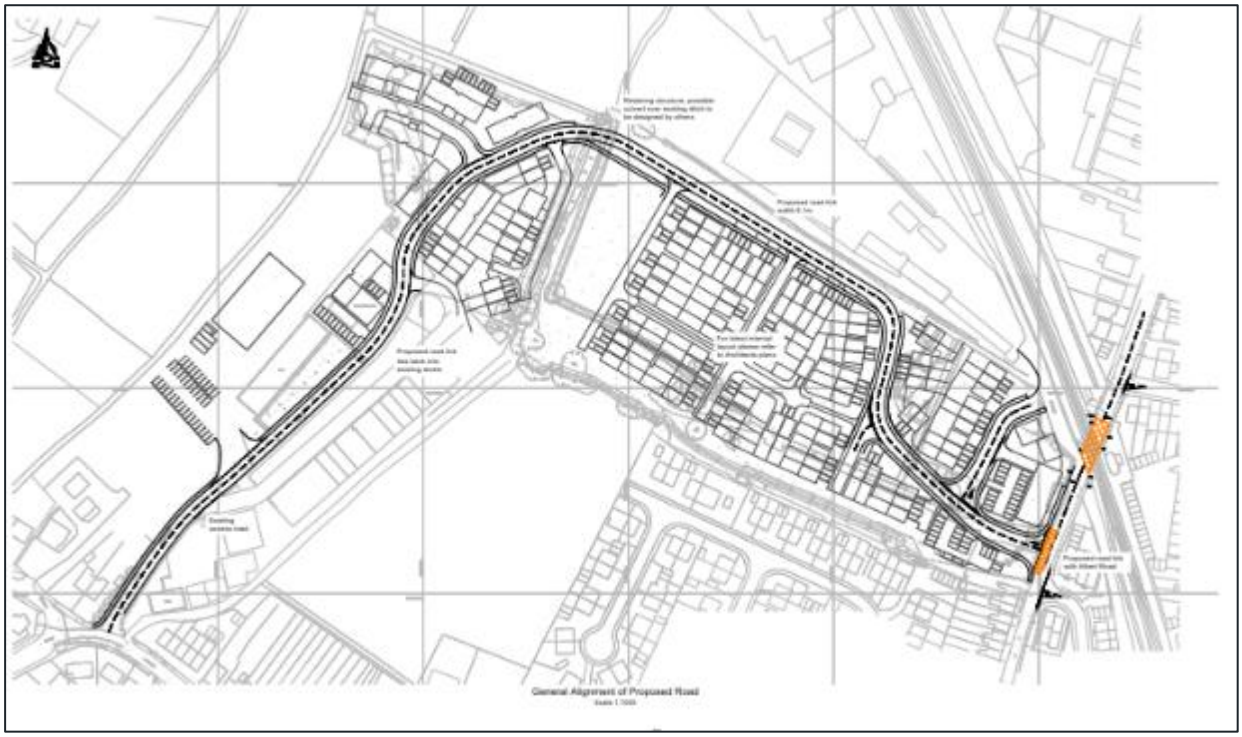


Figure 3-5: Albert Lane Road Layout

3.3 Explicitly modelled development assumptions

3.3.1. The uncertainty log information provided by DDC, in relation to committed housing and developments within Dover included the total number of dwellings and/ or jobs at each development site. This section outlines the key inputs and assumptions adopted in the network development for these developments.

Aylesham and Snowdown Sites

3.3.2. The Aylesham TA details a number of transport infrastructure improvement schemes to support the development, these are summarised as follows:

- Changing the one-way link around the market square to provide a two-way link;
- Severing a short section of the market square link;
- Improving means of access to the site from the A2 to the west of Adisham Road to the north in conjunction with traffic calming;
- Traffic calming part of Aylesham Village to ensure 20mph speed zones; and
- Providing a new link road to the station to improve accessibility.

3.3.3. The primary access to the new village extension is from Dorman Avenue North. As the network detail within the existing DDTM currently only includes the B2046 in Aylesham, the

Aylesham Village will be modelled via a junction between B2046 Adisham Road / Dorman Avenue North and will not consider the detailed modelling of traffic calming measures or the market square.

St James's Site

3.3.4. As part of the St James's development, a site access signal scheme has been approved, as shown in Figure 3-6. This scheme has been delivered since 2015 and as such will need including within the forecast scenarios; the scheme has been coded into the DDTM using the drawing provided and Google Street View.

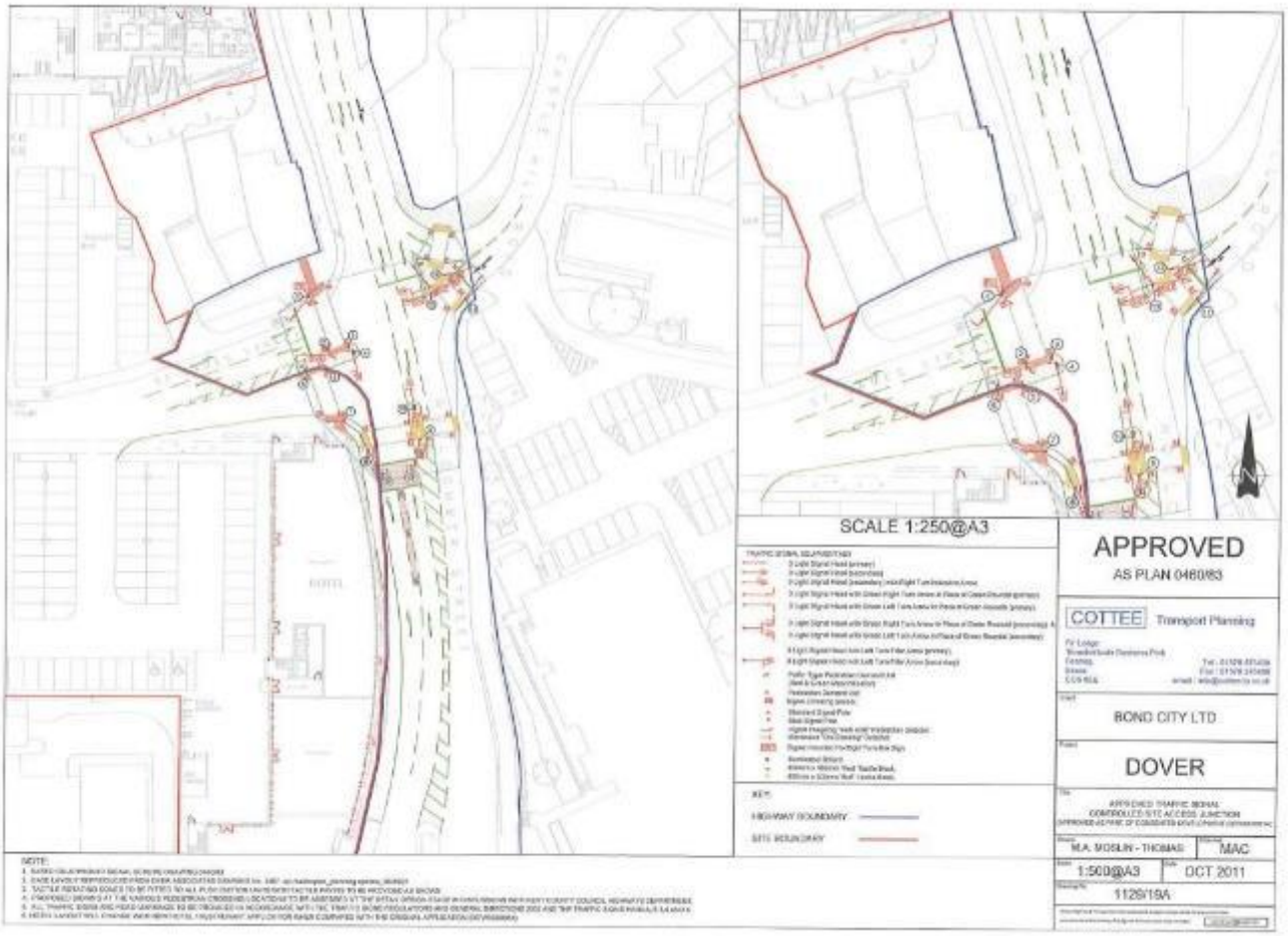


Figure 3-6: St James's Site, Approved Site Access Signal Scheme

Whitfield Urban Extension Plan

3.3.5. Figure 3-7 shows the proposed highway infrastructure improvements as part of the Whitfield urban extension plan.

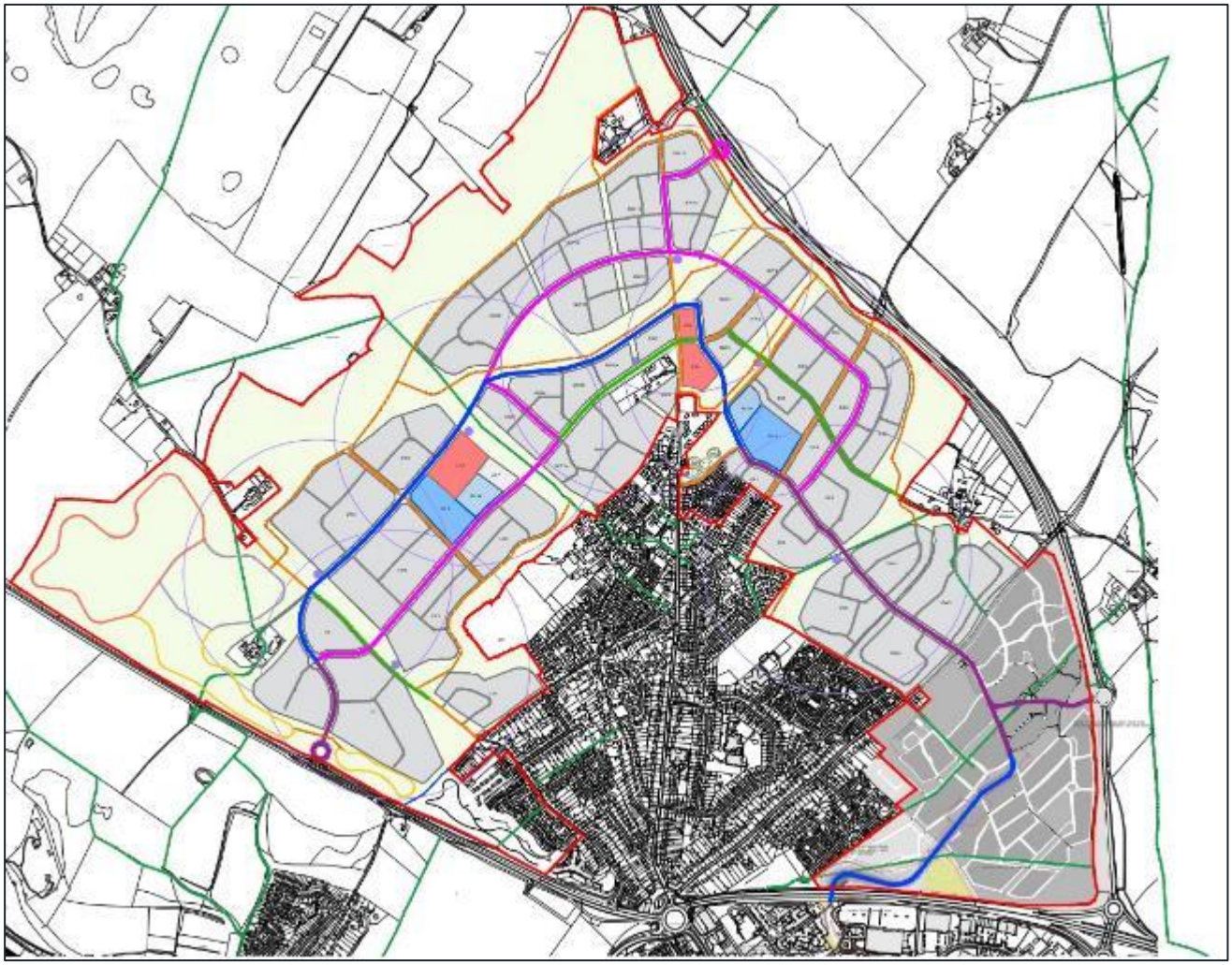


Figure 3-7: Whitfield Urban Extension Plan, Proposed Highway Infrastructure Improvements

3.3.6. The outline application for the consented scheme triggered junction improvements at Whitfield Roundabout after the 800th dwelling was built out. In the Do Minimum scenario, the only infrastructure changes at Whitfield are the A256 Phase 1/1a access roundabout, which has been completed since the 2015 DDTM base model development.

3.3.7. It was agreed by DDC, KCC and NH that 800 dwellings only would be modelled at WUE within the Do Minimum as this was considered to be a realistic scenario. Inclusion of 801 dwellings (or more) would trigger improvements at Whitfield Roundabout and it was agreed between parties that it is robust to assume improvements at Whitfield were incorporated when assessing the potential Local Plan allocations in the subsequent Do Something models. The remainder of the extant development has been assessed within two different

Do Something scenarios, which will allow DDC to test different mitigation measures required to bring the site forward as a whole.

3.3.8. For the purposes of the transport modelling assessment, a Do Something 1 scenario was developed that assumes 2,000 dwellings and WUE and Do Something 2 scenario that assumes 4,930 dwellings at WUE, plus any additional potential allocations in the Local Plan, will be delivered by 2040. In reality, the development will be phased over a longer period but this assessment approach with allow DDC to demonstrate the deliverability of the site as a whole, taking a comprehensive approach.

Connaught Barracks

3.3.9. Infrastructure changes surrounding the potential Connaught Barracks Local Plan allocation were coded into the networks to represent Figure 3-8. The introduction of a new link between Dover Road and A258 is proposed to become the primary route for Dover Road through-routing vehicles and development traffic accessing directly on to the new link. The new link is proposed to meet the A258 at a signalised junction, where the new link is the minor arm; indicative phasing and signals have been included within the Do Something models and optimised for the respective time periods. It is proposed that Dover Road is stopped up at the intersection with the new link, and development traffic or existing vehicles wishing to access will do so via the A258 / Dover Road junction to the south.

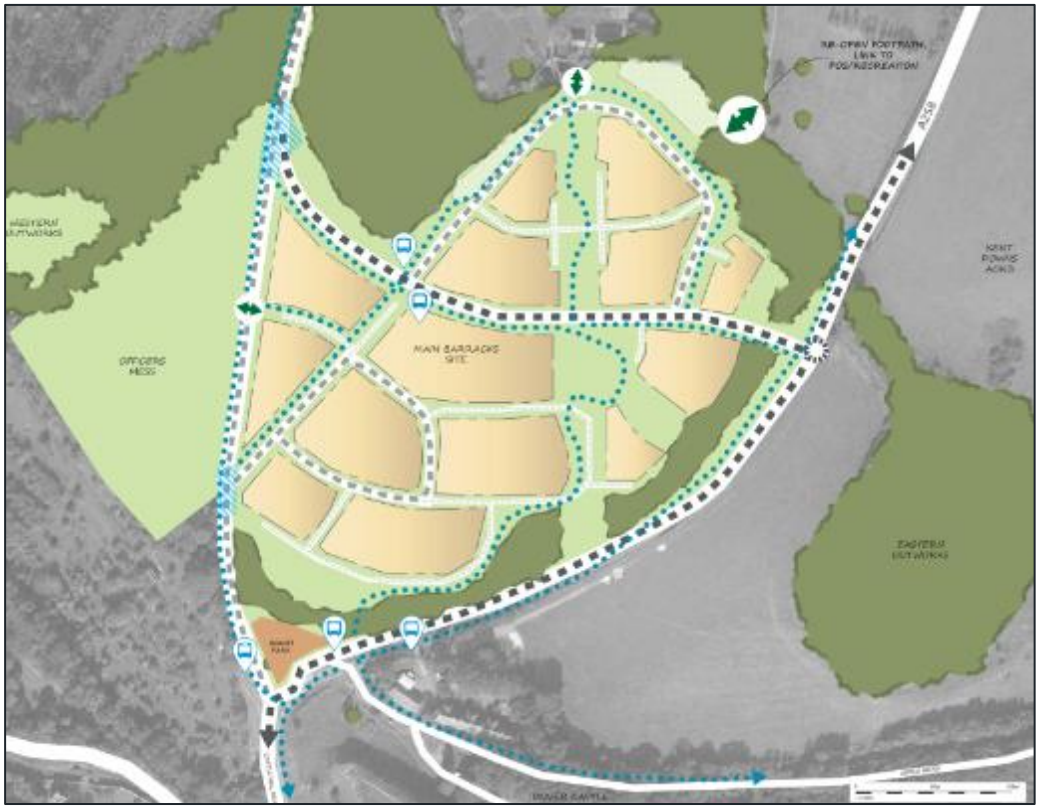


Figure 3-8: Connaught Barracks Masterplan and Associated Infrastructure

3.4 Proposed Junction Improvements

3.4.1. As part of Whitfield Phase 1/1a only 800 houses have been assumed to be built in the 2040 Do Minimum as the inclusion of 801 dwellings (or more) would trigger improvements at Whitfield Roundabout. This was the assumption which was also used in the Regulation 18 Forecasting work and has been agreed with KCC and NH. The proposed Whitfield roundabout solution agreed for the planning application for Phase 1 when more than 800 houses are built is now deemed inadequate for NH and therefore an alternative improvement is required.

3.4.2. In May 2022 junction improvement proposals at Whitfield Roundabout and Duke of York roundabout were agreed upon by National Highways, Kent County Council and Dover District Council and are assumed to be built out by 2040. As the 2040 DS1 and DS2 models will have greater than 801 dwellings at Whitfield the Do Something VISUM models include the junction mitigations outlined below.

Whitfield Roundabout

3.4.3. The design at the Whitfield roundabout was developed and modelled using TRANSYT modelling software to increase the potential capacity at the roundabout. This was reported and agreed with NH and KCC in May 2022, a Technical Note outlining the Transyt work and modelling results are in Appendix B, in separate document. alongside the highways design report for the junction. This included the following junction improvements:

- Sandwich Road entry. The give-way entry remains unchanged as does the 3-lane circulatory section. The exit remains with 2 lanes, but it has been assumed that traffic will not be deterred from using lane 2 by the nearby right turn beyond the roundabout exit.
- A2 (East) entry. The 2-lane approach has been widened to 2 lanes plus a nearside 50m long flared lane. It has been assumed that the widening to enable this, has taken place in the nearside verge, and has not resulted in reduced stacking room on the opposing circulatory lanes. The circulatory section and exit to A2 eastbound remain unchanged.
- Honeywood Road entry. The 2-lane approach has been widened to 2 lanes plus a nearside 50m long flared lane. As in the case of A2 (East), it has been assumed that the widening has taken place in the nearside verge. The circulatory section has been widened from 2 lanes to 3 and the exit to Honeywood Road remains unchanged.
- Whitfield Hill entry. The northbound approach has been widened to a long 2-lane approach, and a short flared 3-lane section about 30m long, up to the stop line. The circulatory section has been widened from 2 lanes to 3, with no reduction in the stacking room. The exit to Whitfield Hill remains unchanged at 2 lanes.

- A2 (West) entry. The 2-lane approach has been widened to 2 lanes plus a nearside 50m long flared lane. It has been assumed that the widening has not resulted in reduced stacking room on the opposing circulatory lanes. The circulatory section and exit to A2 westbound remain unchanged.

3.4.4. Figure 3-9 details the junction mitigations assumed at Whitfield Roundabout in the Regulation 19 model.

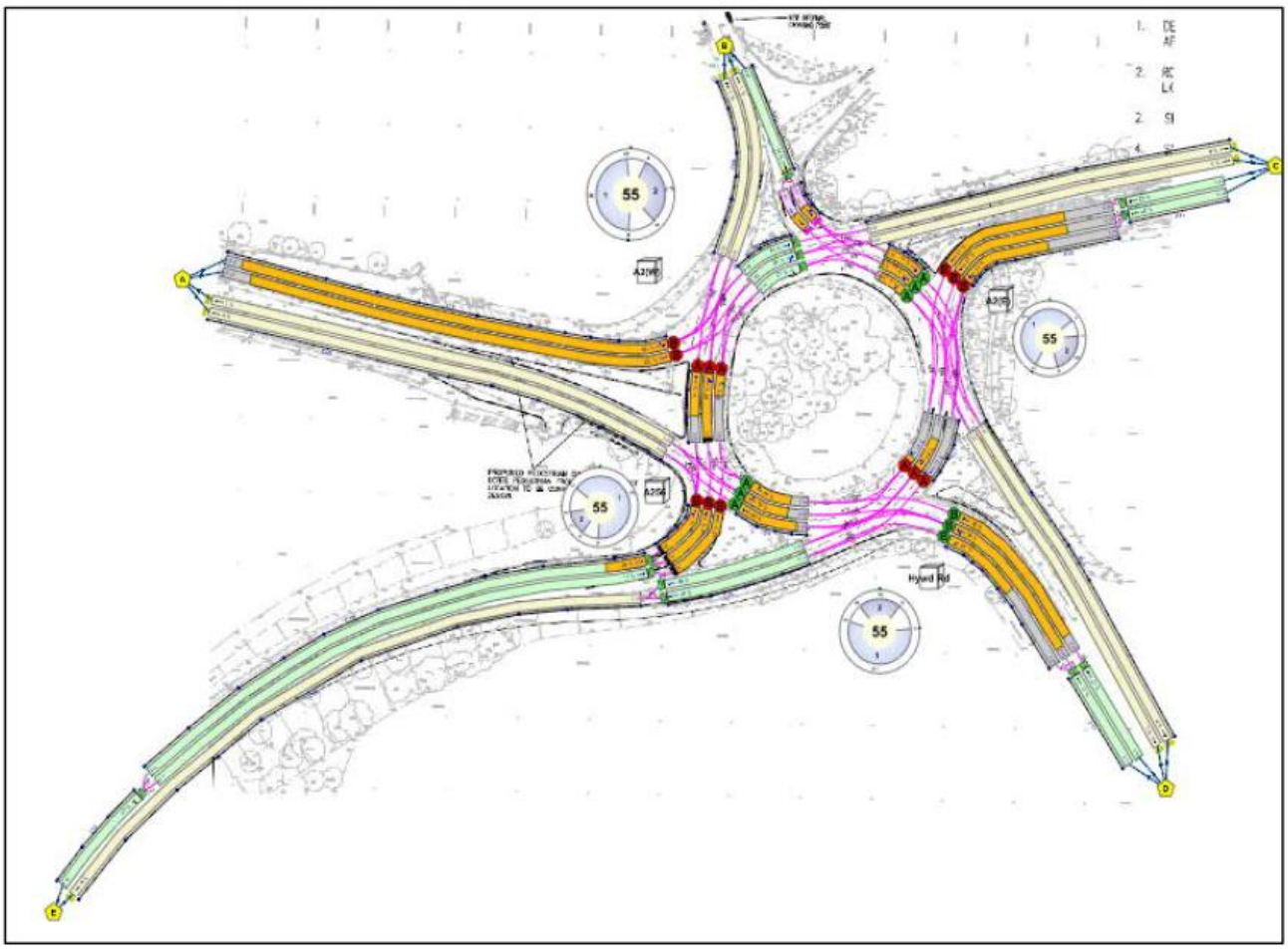


Figure 3-9: Whitfield Roundabout Junction Mitigation

Duke of York Roundabout

3.4.5. The Duke of York Option 1 design was incorporated into the VISUM model. This proposal was assessed within Transyt and agreed with NH and KCC, the Transyt and highways reports can be found in Appendix C, in separate document. The design includes the signalisation of the A2 (E and W) and A258 Deal Road approaches. A258 Castle Hill Road continues to operate as priority controlled.

3.4.6. The cycle time was at this junction was set to 50 seconds as proposed in the TRNSYT modelling work. This was a reasonable compromise between shorter cycle times, which would tend to reduce queues but also reduce capacity, and longer cycle times, which would tend to increase capacity, but would increase the risk of blocking back owing to excessive queues in circulatory lanes. Signals were optimised in both the AM and PM peak to ensure there were no excessive delays. Figure 3-10 details the junction design agreed for the Duke of York roundabout.

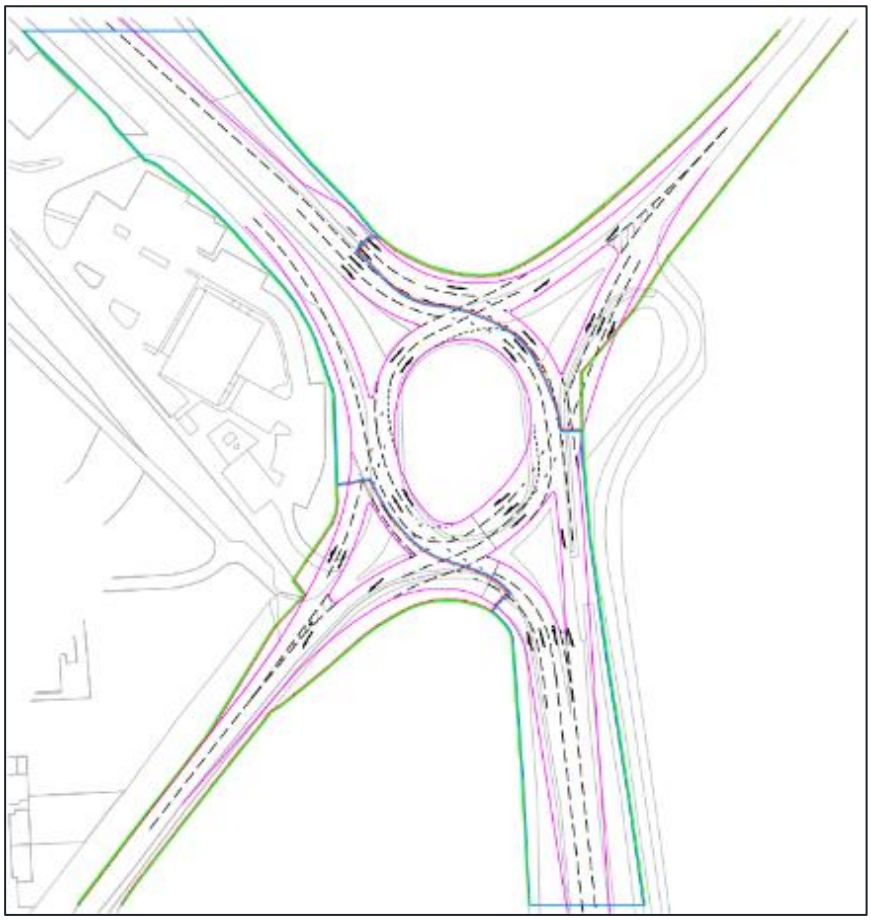


Figure 3-10: Duke of York Roundabout Junction Mitigation

3.5 Summary

3.5.1. This chapter has been written to detail the network changes incorporated into the forecast network as part of the forecast supply and evidence by data provided to WSP by DDC.

3.5.2. All sites within this chapter have been modelled in the Do Something 1 and Do Something 2. The Do Minimum includes all improvements with the exception of the Whitfield and Duke of York roundabout improvements.

4

FORECASTING DEMAND

PUBLIC

4 Forecasting Demand

4.1 Introduction

4.1.1. This chapter sets out the information provided to WSP to inform the development of forecast trip matrices representing the expected growth in trips between the 2015 base year and the 2040 forecast year. This includes information on residential and commercial developments received from DDC in relation to completions between 2015 and 2021, and consented development expected to be built out prior to 2040.

4.1.2. Trip generation associated with specifically modelled developments in addition to background growth for Car, LGV and HGV user classes is outlined within this chapter to summarise all matrix inputs and present the overall growth between 2015 and 2040.

4.2 Methodology

4.2.1. To develop the Do Minimum and Do Something modelling scenarios it was necessary to build demand trip matrices in relation to the forecast year 2040. The methodology to derive the Do Minimum forecast trip matrices is described below.

4.2.2. There are two key elements to the forecast demand development which will be discussed in this Chapter, as follows:

- Committed development trip generation; and
- Background Growth.

4.2.3. Committed development trip generation will establish the forecast trips that will be generated by specifically known developments, which have planning consent ('Near Certain') for the Do Minimum Scenario. The processing of these sites is as follows:

- **Uncertainty Log**: Establish an uncertainty log of site-specific developments within the study area, whereby the term development refers to either residential or commercial site use;
- **Allocation to Model Zones**: Allocate these site-specific developments a corresponding VISUM zone within the DDTM;
- **Trip Rates**: Calculate trip rates to convert the number of dwellings/jobs into peak hour trips in the forecast years; and
- **Proportion of Trips Amongst Car User Classes**: Proportion out these development trips across the user classes.

4.2.4. Background growth for Cars, applied to areas outside of Dover District, establishes the forecast trips that will be generated by increases in housing and employment growth, once the specifically modelled sites have been removed; growth for LGVs/HGVs is unadjusted and applied across all districts in the model. Background growth comes from the following:

- **Car Growth Factors**: Obtain the unadjusted growth factors (constraint) from TEMPro. Determine the adjusted growth factors via the application of alternative planning assumptions; and
- **LGV and HGV Growth factors**: Apply 2018 National Road Traffic Forecast (NRTF) factors to account for user class UC2 (LGV) and UC3 (HGV) growth in a respective forecast year model.

4.2.5. The committed development and background growth are combined and distributed using a Furness method to produce a set of forecast year matrices for the respective model years and peak periods. A TEMPro capacity constraint is applied to cap the total number of forecast trips.

4.3 Completed and Committed Developments

4.3.1. DDC provided a development uncertainty log to WSP which contained the uncertainty status of a series of housing and employment developments within the respective local authority detailing the committed housing and employment growth expected between the model year 2015 and the proposed forecast year, 2040. DDC provided the following information:

- **Completions**: housing and employment completions between 2015 and March 2021; and
- **Extant Sites**: housing and employment sites with consented planning permission that are forecast to be delivered before 2040.

4.3.2. In the Do Minimum scenario, only those residential and employment sites with planning consent, and thus classified as 'Near Certain' using DfT TAG Guidance, will be included.

4.3.3. For the Do Minimum scenario, there will be no TEMPro background growth and instead the sole growth within Dover will come from the completions and consented sites. This information has been reviewed and a summary is shown in Table 4-1.

Table 4-1: Dover Authority Housing and Job Growth Predictions (DM Scenario)

Housing Growth Origin	Net Increase Dwellings	Net Increase Jobs
Completions 2015 to 2021	2,852	369
DDC 2021 to 2040 Extant sites with Planning Permission	5,063	2,407
Total	**7,915**	**2,776**

4.3.4. Table 4-1 shows the predicted growth in housing and jobs across Dover District and the various sources of this growth. The detailed site information which lies behind the assumptions for sites which have been completed since 2015 and those with extant planning permission, can be found in Appendix D to Appendix G, in separate document.

4.3.5. Committed housing and employment trip generation will be applied in the following ways:

- **Housing**: using the consented and extant housing information provided by DDC, WSP have calculated the net change in housing. Trip rates will be applied to the net development quantum and subsequent trip generation will be allocation to the existing model zone in which the zone lies.
- **Employment**: as different trip rates are applied for varying employment land uses, it was deemed appropriate to calculate the trip generation for each site, regardless of whether it was a loss of gain, and summarise the total net trip generation for each existing model zone. It has therefore been assumed that each of the demolition sites are currently occupied, and thus a loss in jobs.

Completions

4.3.6. The DDTM represents a 2015 base year and so it is important to first consider housing and employment developments that have been built out since 2015 when calculating trip generation associated committed developments.

4.3.7. DDC provided WSP with a comprehensive list of housing development completions, presented in full in Appendix D, in separate document, and showing that 2,852 dwellings were built out between 2015 and 2021.

4.3.8. The employment completions for Dover between 2015 and 2021, by land use and site location have been detailed within Appendix E, in separate document. In summary, a net increase of 37,227sqm of employment land use, equivalent to 369 jobs, was built out between 2015 and 2021.

Extant Sites

4.3.9. Housing and employment sites with planning permission have been included as part of the committed developments within the forecast matrices as they are consented and their committed developments. Their full build out quantum and trajectory were provided to WSP by DDC; where the information was readily available, trips rates were extracted from the development Transport Assessment's and were used to calculate the unique trip generation associated with these sites.

4.3.10. Appendix FAppendix F, in separate document, presents the extant housing sites which have planning permission and are forecast to be built out prior to 2040. It is useful to note that WUE features multiple times in the list however the total completed, and extant housing quantum forecast at Whitfield does not exceed 800 dwellings, as per guidance from DDC. The remainder of the extant development is tested within the Do Something.

4.3.11. The number of jobs in each extant site with planning permission has been calculated using the Employment Density guide and has been presented in Appendix G, in separate document. It is considered that all of these sites will be delivered before 2040 based on a trajectory provided to us by DDC. The total loss and gain in jobs have been presented for each site, where possible these were taken directly from the consented TA relevant to the site. WSP will calculate the trip generation associated with each of these changes to determine the net change in trip generation.

Explicitly Modelled Developments

4.3.12. For the purposes of building the Do Minimum and as a result of discussions with DDC, KCC and NH, it is considered that sites with a combined completed and extant total, for all land uses, of more than 100 households or jobs should be explicitly modelled. Trip generation from explicitly modelled developments is added to a new model zone that has been created to represent a single specific site; this allows for more detailed analysis of the transport impacts of a particular site should this be required by DDC at a later stage.

4.3.13. Each of the developments that will be explicitly modelled have already been included as part of the master lists presented in Appendix D to Appendix G, in separate document.

4.3.14. Table 4-2 separates out the explicitly modelled developments in both the DM and DS that will be allocated a unique zone number, within Dover to present in further detail.

4.3.15. It is noted that whilst the criteria of greater than 100 dwellings or jobs has on the most part, been applied to each application number separately, for Whitfield Urban Expansion, Aylesham Village Expansion and Discovery Park all separate applications have been included as these are considered to be the largest housing and employment developments.

Table 4-2: 2040 Do Minimum Scenario, Explicitly Modelled Housing and Employment Sites

WSP ID	App Number	Site Address	HHs	Jobs	Associated Infrastructure
S_2070	13/00945	Land between Deal & Sholden, Church Lane, Sholden, Deal (Timperley Place)	230		Additional development road leading north from Church Lane and Hunters Walk
S_112 S_113 S_114	07/01081 16/00180 16/00985	Aylesham Village Expansion, Aylesham	173 277 162		Two-way link around market square; a new link road to the station; traffic calming in Aylesham Village to ensure 20mph zone; improving access from the A2 to the west of Adisham Road
S_20335	20/00419	Betteshanger Colliery, Betteshanger, Deal	210		Assumed connection obtained via existing A258 Sandwich Road Roundabout
S_20336	19/00447	Connaughts Barracks, Dover	300		New link proposed between Dover Road and A258
S_20337	21/00402	Land south west of Sandwich Road, Sholden	110		Priority Junction with A258
E_1001	07/00404	Minters Yard, Southwall Road		181	Access will be at the existing Minters Industrial private access road for / Southwall Road priority junction
E_1004	10/01011	Whitfield Urban Extension, (land to east of Sandwich Road and north west of Napchester Road)		478	A new access road from WUE to Archers Ct Rd (Richmond Way). New access road on A256 with a new at-grade roundabout A256 Whitfield Bypass / Richmond Way.
E_1008	14/01138	Site of former Tilmanstone Colliery Tip, Pike Road		278	Accessed via existing highway infrastructure
S_1071	17/01523	Former Buckland Hospital, Coombe Valley Road, Dover	150		Priority junction with Coombe Valley Road, utilises the former Hospital access
S_107 E_1010 E_1013 E_5127	14/00058 13/00783 14/00058 16/00045	Discovery Park, Enterprise Zone, Ramsgate Road	500	1,874	A this is a redevelopment of an existing site, WSP have assumed no additional network changes
E_1049	17/00451	Betteshanger Sustainable park		164	Priority junction with Betteshanger Road
E_5026	14/00549	The Old Harbour Station, Elizabeth Street		209	Change of use and so WSP assume no additional network detail is required
E_5128	16/00976	Land at Honeywood Parkway, WCBP		158	To be modelled as an additional roundabout approach / arm at Honeywood Parkway
E_5129	15/00595	Site west side of Woolcomber Street & South of St James Street		101	Priority junction with St James Street (west of Woolcoomber Street)
E_8000	18/01206	Land rear of Dubris Close, Honeywood Parkway		170	Priority junction with Honeywood Parkway, 100m East of Kedleston Road

**total completed and extant households/jobs, combined land uses*

4.3.16. Figure 4-1 graphically presents the residential completions between 2015 and 2021 and Figure 4-2 shows the sites with extant planning permission. These are all sites with a total development size, by 2040, of greater than 10 dwellings. Inserts have been provided to present the completions and extant sites in Dover and Deal; the labelling shows the WSP ID which matches up with the first column of Appendix D and Appendix F, in separate document, respectively.

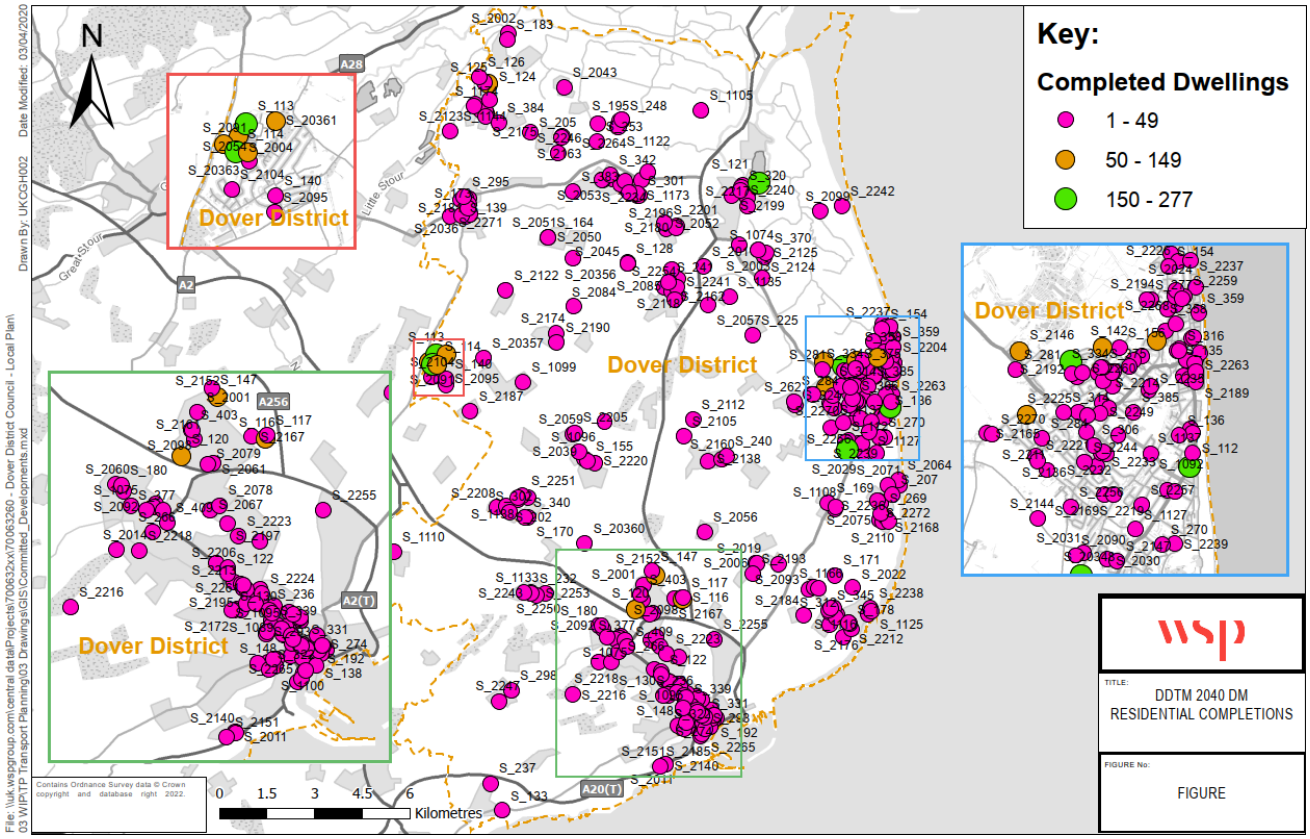


Figure 4-1: DDTM Do Minimum, Residential Committed Developments – Completions

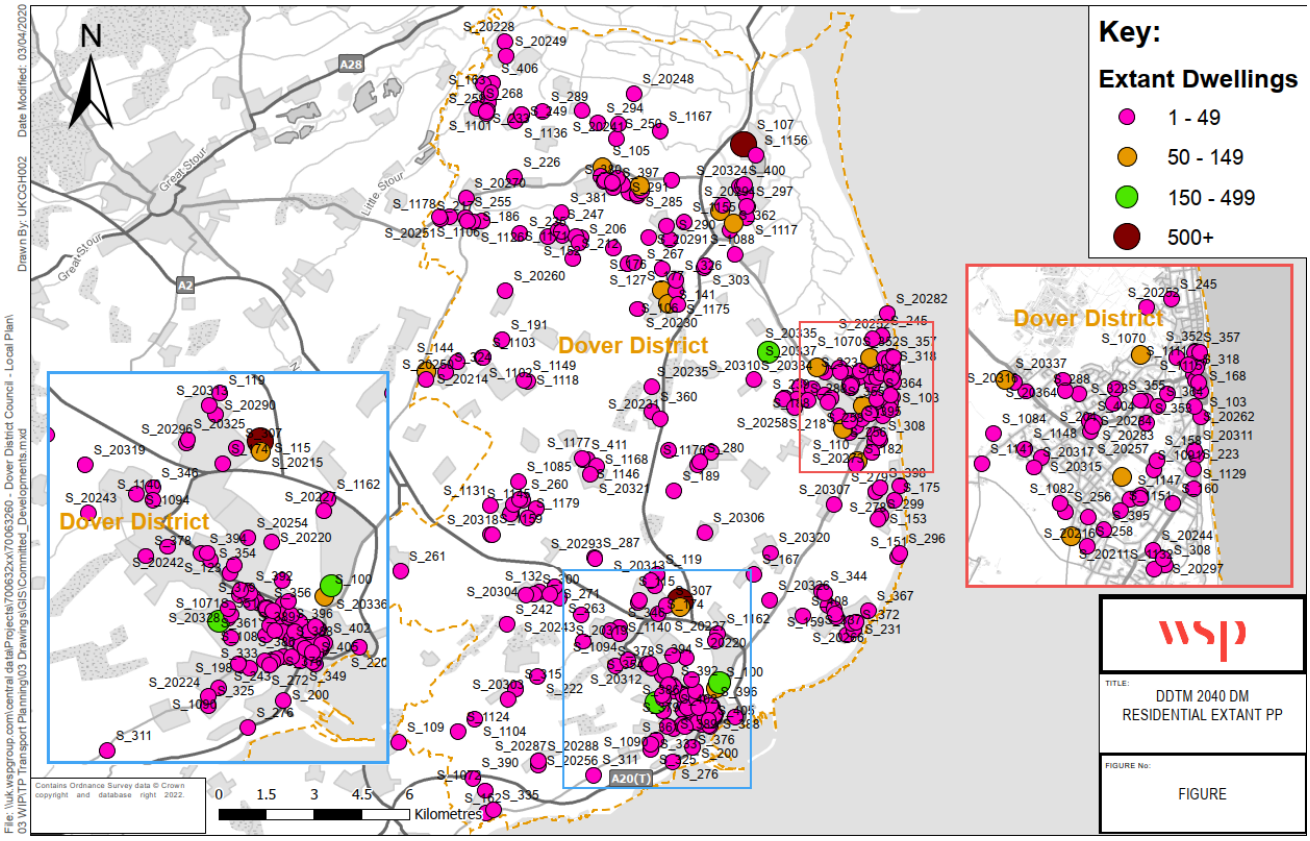


Figure 4-2: DDTM Do Minimum, Residential Committed Developments - Extant Planning Permissions

4.3.17. Figure 4-3 graphically presents the employment completions between 2015 and 2021 and Figure 4-4 shows the sites with extant planning permission. These are all sites with a total development size, by 2040, of greater than 10 jobs and it should be noted that the maps do not show demolition sites. Inserts have been provided to present the completions in Dover; the labelling shows the WSP ID which matches up with the first column of Appendix E and Appendix G, in separate document, respectively.

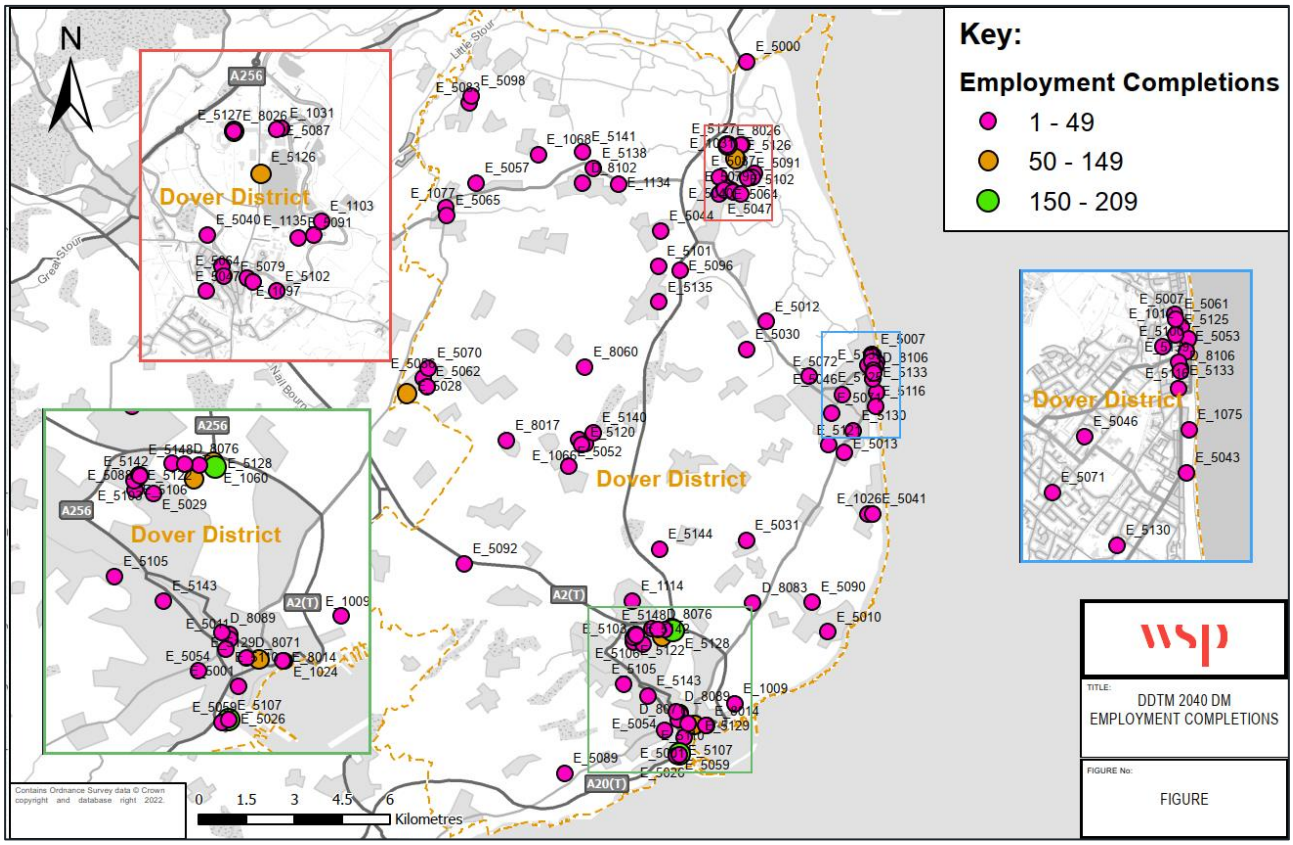


Figure 4-3: DDTM Do Minimum, Employment Committed Developments – Completions

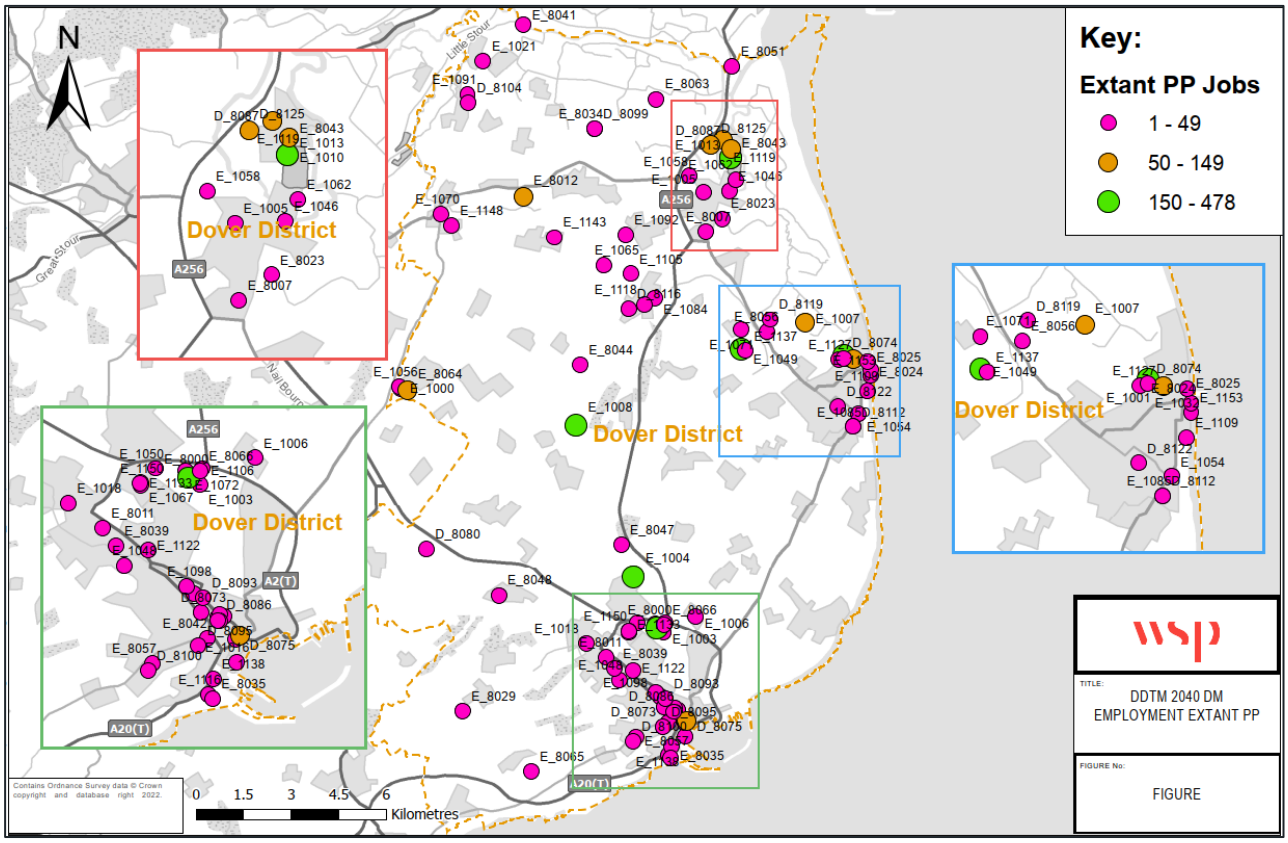


Figure 4-4: DDTM Do Minimum, Employment Committed Developments – Extant Planning Permissions

Trip Rates

4.3.18. Where WSP were able to locate Transport Assessments (TA's) for completed sites or extant sites with planning permission, trip rates were extracted for specific committed developments and applied to the 2040 development quantum. These vehicular trip rates have been summarised, by development, in Table 4-3 and Table 4-4.

Table 4-3: Committed Housing Developments, TA Vehicular Trip Rates (per dwelling)

WSP ID	AM Peak (08:00 – 09:00) (per dwelling)			PM Peak (17:00 – 18:00) (per dwelling)		
	Origin	Destination	Two-Way	Origin	Destination	Two-Way
S_120	0.454	0.160	0.614	0.242	0.423	0.665
S_122	0.516	0.203	0.719	0.333	0.495	0.828
S_136	0.217	0.056	0.273	0.068	0.182	0.250
S_140	0.310	0.117	0.426	0.176	0.283	0.459
S_147	0.385	0.136	0.521	0.192	0.385	0.577
S_133	0.435	0.160	0.595	0.167	0.414	0.581
S_20347	0.378	0.144	0.522	0.207	0.351	0.558
S_20348	0.336	0.139	0.475	0.167	0.305	0.472
S_100	0.454	0.145	0.599	0.214	0.416	0.630
S_105	0.396	0.124	0.520	0.216	0.411	0.627
S_106	0.431	0.169	0.600	0.221	0.379	0.600
S_107	0.837	0.235	1.072	0.367	0.584	0.951
S_109	0.431	0.169	0.600	0.221	0.379	0.600
S_110	0.420	0.160	0.580	0.230	0.390	0.620
S_115	0.443	0.158	0.601	0.236	0.412	0.648
S_119	0.287	0.153	0.440	0.185	0.260	0.445
S_132	0.541	0.204	0.745	0.308	0.494	0.802
S_137	0.082	0.106	0.112	0.046	0.075	0.121
S_141	0.366	0.159	0.525	0.216	0.381	0.597
S_145	0.235	0.235	0.470	0.294	0.353	0.647
S_1069	0.071	0.128	0.199	0.185	0.200	0.385
S_1070	0.385	0.101	0.486	0.167	0.305	0.472
S_1071	0.700	0.200	0.900	0.300	0.500	0.800
S_1072	0.417	0.153	0.570	0.202	0.367	0.569
S_1079	0.412	0.148	0.560	0.124	0.370	0.494
S_1080	0.144	0.057	0.201	0.098	0.149	0.247
S_1084	0.151	0.057	0.208	0.066	0.138	0.204
S_20211	0.490	0.130	0.620	0.230	0.420	0.650

WSP ID	AM Peak (08:00 – 09:00) (per dwelling)			PM Peak (17:00 – 18:00) (per dwelling)		
	Origin	Destination	Two-Way	Origin	Destination	Two-Way
S_20214	0.458	0.170	0.628	0.229	0.405	0.634
S_20221	0.350	0.131	0.481	0.119	0.312	0.431
S_20223	0.350	0.131	0.481	0.119	0.312	0.431
S_20332	0.458	0.170	0.628	0.229	0.405	0.634
S_20333	0.343	0.137	0.480	0.173	0.320	0.492
S_20334	0.408	0.149	0.557	0.216	0.373	0.589
S_20335	0.376	0.136	0.512	0.162	0.357	0.519
S_20336	0.306	0.146	0.452	0.170	0.279	0.449
S_20337	0.385	0.101	0.486	0.167	0.305	0.472

4.3.19. Table 4-4 presents the trip rates that have been assumed for the committed development employment trips where a TA was available.

Table 4-4: Committed Employment Developments, TA Vehicular Trip Rates

WSP ID	Land Use		AM Peak (08:00 – 09:00)			PM Peak (17:00 – 18:00)		
			Origin	Destination	Two-Way	Origin	Destination	Two-Way
E_1001	Industrial Units	Per 100sqm	0.410	1.180	1.590	0.150	0.280	0.430
E_1001	Offices	Per 100sqm	0.360	1.660	2.020	1.400	0.250	1.650
E_1003	B2/B8	Per 100sqm	0.130	0.730	0.860	0.620	0.130	0.750
E_1004	B1	Per 100sqm	0.190	1.547	1.737	1.263	0.218	1.481

4.3.20. Where it was not possible to locate the consented TA or where the TA did not provide sufficient information to determine the peak hour trip rates, trip rates for each land use have been derived from the TRICS database and are presented in Table 4-5. The full output from TRICS can be seen in Appendix H, in separate document.

Table 4-5: DDTM TRICS Trip Rates

Land Use		AM Peak (0800-0900)			PM Peak (1700-1800)		
		Origin	Destination	Two-Way	Origin	Destination	Two-Way
B1 Office	Per 100sqm	0.087	1.222	1.309	1.066	0.053	1.119
Food Superstore	Per 100sqm	1.747	2.188	3.935	2.358	2.222	4.58
Hotel	Per bed	0.254	0.116	0.37	0.108	0.228	0.336
Restaurant	Per 100sqm	0	0	0	0	1.786	1.786
Shopping Centre-local shops	Per 100sqm	3.151	3.499	6.65	5.762	5.249	11.011
Houses Privately owned	Per dwelling	0.351	0.106	0.457	0.176	0.32	0.496
Business Park	Per 100sqm	0.262	1.62	1.882	1.257	0.187	1.444
Industrial Units	Per 100sqm	0.246	0.613	0.859	0.858	0.082	0.94
Industrial estates	Per 100sqm	0.212	0.818	1.03	0.791	0.123	0.914
B8 Warehousing Commercial	Per 100sqm	0.066	0.115	0.181	0.116	0.065	0.181
Other Individual Non-food superstore	Per 100sqm	0	0.5	0.5	0.587	0.337	0.924
Mixed Shopping Mall	Per 100sqm	0.727	1.424	2.151	1.876	1.451	3.327
Nursing Homes	Per bed	0.1	0.067	0.167	0.033	0.1	0.133
Flats Privately Owned	Per dwelling	0.182	0.058	0.24	0.083	0.167	0.25

Trip Generation

4.3.21. The trip generation approach used was agreed with NH and KCC. Trip generation for employment sites was calculated using the trip rates multiplied by the number of jobs an employment site proposed. The potential jobs were calculated using the SQM area of the site and dependant on the land use type an employment number was provided. WSP applied the Employment Density Matrix, presented in Table 2-1, for local plan proposals in the same way it was used for Do Minimum development.

4.3.22. Trip generation for residential zones were calculated in a similar way, whereby according to the DDC local growth, trip rates per house were calculated and multiplied by the proposed number of dwellings.

4.3.23. The trip generation associated with the residential and employment completed, and consented developments is detailed in full in Appendix I, in separate document.

Trip Distribution

4.3.24. The additional trips that were added to the network followed the same zonal distribution of the existing model.

4.4 Background Growth

4.4.1. Background growth for Cars has been extracted from TEMPro, using NTEM 7.2 in study areas considered appropriate for this assessment given the coverage of the detailed area of modelling ("simulation area"). As TEMPro only predicts demand for non-LGV/HGV modes, LGV and HGV growth is predicted using the Road Traffic Forecasts (RTF) 2018. The methods used for applying growth factors to all vehicle types are discussed further in this chapter.

4.4.2. It is important to note NTEM 8 has been released in Draft status since the development of these scenarios and the car growth factors in NTEM 8 are lower indicating that the current assessments represent a worst-case scenario in terms of background growth in traffic.

Car Growth Factors

4.4.3. The origin and destination car driver growth rates, by study area, are shown in Table 4-6 and Table 4-7 for the AM and PM peak respectively.

Table 4-6: Car Background Growth 2015 to 2040, AM Peak

Area	Name	Origin	Destination
Study Area 1	Dover District	1.2327	1.2179
Study Area 2	Kent*	1.1890	1.2099
Study Area 3	South East**	1.1962	1.1993

*excluding Dover; **excluding Kent

Table 4-7: Car Background Growth 2015 to 2040, PM Peak

Area	Name	Origin	Destination
Study Area 1	Dover District	1.2254	1.2366
Study Area 2	Kent*	1.2086	1.1964
Study Area 3	South East**	1.1984	1.1966

*excluding Dover; **excluding Kent

4.4.4. The only growth within Dover in the Do Minimum scenario is that from the committed housing and employment developments discussed within this report; background growth is only applied to the study area outside of Dover District.

4.4.5. The housing and employment projections for Dover within the 'alternative assumptions' function in TEMPro, have therefore been set equal to the 2015 base. Adjusted TEMPro growth rates will be applied to the model zone to take into account growth in housing and employment where the location is yet to be determined. This growth will be applied equally across the study areas, with total growth constrained to TEMPro.

4.4.6. The adjusted TEMPro growth rates for AM and PM Peak car drivers are shown in Table 4-8 and Table 4-9 respectively.

Table 4-8: Car Background Growth (Alternative Assumptions) 2015 to 2040, AM Peak

Area	Name	Origin	Destination
Study Area 1	Dover District	0.9615	1.0821
Study Area 2	Kent*	1.1890	1.2099
Study Area 3	South East**	1.1963	1.1994

*excluding Dover; **excluding Kent

Table 4-9: Car Background Growth (Alternative Assumptions) 2015 to 2040, PM Peak

Area	Name	Origin	Destination
Study Area 1	Dover District	1.055	0.9761
Study Area 2	Kent*	1.2086	1.1965
Study Area 3	South East**	1.1984	1.1966

*excluding Dover; **excluding Kent

LGV/HGV Growth Factors

4.4.7. The 2018 NRTF will be used to forecast the growth in non-port LGV and HGV trip demand. The LGV and HGV growth factors derived from NRTF for the South East (all areas) are set

out in Table 4-10 and will be applied across the matrix (excluding the port zone), including Dover District

Table 4-10: NRTF LGV and HGV Growth Rates from 2015 to 2040 – South East (All Areas)

Vehicle	RTF
LGV	1.398
HGV	1.127

Port Growth

4.4.8. In 2015, WSP contacted the Port of Dover to obtain their predictions of traffic growth through the Port between 2015 and 2031. Port traffic was expected to witness a 45%-55% increase in freight (HGV) and a 10%-15% increase in Cars and LGVs by 2031.

4.4.9. As part of the updated work, in April 2020 WSP contacted Richard Christian at the Port of Dover for updated growth factors for the predicted growth between 2015 and the forecast year of 2040. Ultimately, predicting the possible impacts at the Port in light of long-term impacts of COVID-19 and the ongoing uncertainty surrounding Brexit and future trading with the EU is a difficult assumption to determine.

4.4.10. In the absence of anything more concrete, it is deemed appropriate to assume something which is robust and defendable and therefore WSP, in agreement with Richard Christian at the Port of Dover, have assumed the lower end of the growth provided in 2015. This growth has been presented in Table 4-11.

Table 4-11: Port of Dover Traffic Growth Forecasts

Trade Sector	Growth Factor to 2040
Freight (HGV)	45%
Cars and LGVs	10%

4.5 Matrix Development

4.5.1. The existing trip distribution from the 2015 base year matrices was used as the starting point for the trip distribution process, then scaling via a Furness methodology to distribute forecast trips between origins and destinations while controlling the trip end totals. The trip distribution process is detailed below:

- **Background Growth**: The adjusted growth factors have been applied to the row and column totals of the base year matrix to obtain the background trip ends and then have been distributed using the Furness method to generate the background growth matrix;
- **Development Growth**: The location of the explicitly modelled development sites was reviewed and VISUM zones with similar land use and location where assigned as the source for its distribution. Similar to the background growth, the trip ends obtained in the

trip generation process have been distributed using a Furness method to generate the development growth matrix;

- **Unconstrained Matrix**: The background growth and development trip matrices have been added to generate the unconstrained matrix;
- **TEMPro Constraint Matrix**: Similar to the background growth, the unadjusted growth factors have been applied to the base year trip ends and distributed using the Furness method to generate the constraint matrix; and
- **Final Forecast Matrix**: A final forecast matrix has been produced by capping the unconstrained matrix OD values where they exceed those of the TEMPro constraint matrix.

4.5.2. Table 4-12 compares the matrix totals in Passenger Car Units (PCUs) for each of the time periods in the 2040 Do Minimum Scenario and makes a comparison to the 2015 base year matrix.

Table 4-12: 2040 Do Minimum Scenario Matrix Total Comparison

Scenario	Base Year	Background Growth	Committed Development	Final Matrix Total	Difference BY vs FY
AM Peak	36,314	38,351	5,311	44,029	7,715
PM Peak	32,645	34,068	5,717	40,097	7,452

4.6 Summary

4.6.1. The housing and employment completions that have been built out since the 2015 DDTM base model, up to the end of March 2021, have been presented within this chapter for inclusion within the forecast scenarios. DDC provided WSP with the latest (at the time the forecasts were developed) available list of consented housing and employment development (those with extant planning permission) and their trip generation was calculated and included within the Do Minimum and Do Something scenarios.

.

5

LOCAL PLAN ASSESSMENT

PUBLIC

5 Local Plan Assessment

5.1 Introduction

5.1.1. In Autumn 2021, DDC provided WSP with the potential sites which would form part of Regulation 19 for their Local Plan. The potential allocations, plus windfall housing are the only housing and employment growth expected between 2040 Do Minimum scenario and the Do Something.

5.1.2. The Do Something includes development trips from the Regulation 19 allocations which are forecast to be built out between 2021 – 2040 and the highway network has been updated to reflect proposed access locations. The predicted growth within the Do Something is obtained from potential site allocations for both housing and employment. Job quantum has been calculated using the Employment Density Matrix and the methodology summarised in Chapter 2.

5.2 Do Something

5.2.1. The Do Something represent the Regulation 19 residential and employment allocations that were proposed to form the Local Plan; this assessed two scenarios: DS1 the implementation of 7,195 residential dwellings and 4,591 jobs and DS2 the implementation of 10,125 residential dwellings and 4,591 jobs. Table 5-1 summarises the net increase of housing and jobs included in the Do Something scenarios compared with the Do Minimum Scenario.

Table 5-1: Net Housing and Employment, Do Something vs Do Minimum

	Net Dwellings	Net Jobs	Net SQM
Local Plan Sites (DS1)	7,195	4,591	95,604
Local Plan Sites (DS2)	10,125	4,591	95,604

5.2.2. A more detailed breakdown of residential and employment sites from the Do Something can be found in Appendix J and Appendix K, in separate document, respectively. The total dwellings and employment modelled in the Do Something Scenario is summarised in Table 5-2.

Table 5-2: Total Housing and Employment, Do Something Scenario

Do Something Scenario	Total Dwellings	Total Jobs	Total SQM
Completions 2015 -2020	2,852	369	37,227
Extant Planning Permission	5,063	2,407	114,737
Local Plan Sites (DS1)	7,195	4,591	95,604
Local Plan Sites (DS2)	10,125	4,591	95,604
Total DS1	**15,110**	**7,367**	**247,568**
Total DS2	**18,040**	**7,367**	**247,568**

5.2.3. Modelling the Do Something scenario allows for comparisons against the Do Minimum network and conclusions to be drawn as to whether mitigation on the road network may be necessary as a result of the extra trips from the potential allocations loaded onto the road network.

Regulation 19 Housing Allocations

5.2.4. The sites included within the DS scenarios detail the potential for 7,195 and 10,125 residential dwellings over 83 site allocations in the DS1 and DS2 scenario respectively; the location of these sites is illustrated in Figure 5-1. Sites with fewer than 100 dwellings are indicated by a small pink circle; trip generation from these sites is added to the existing polygon within which the site is located. Potential site allocations with greater than 100 dwellings, shown by the orange, green and brown circles depending on their size, have been modelled explicitly and their trip generation has been added to a unique zone representative of that development only.

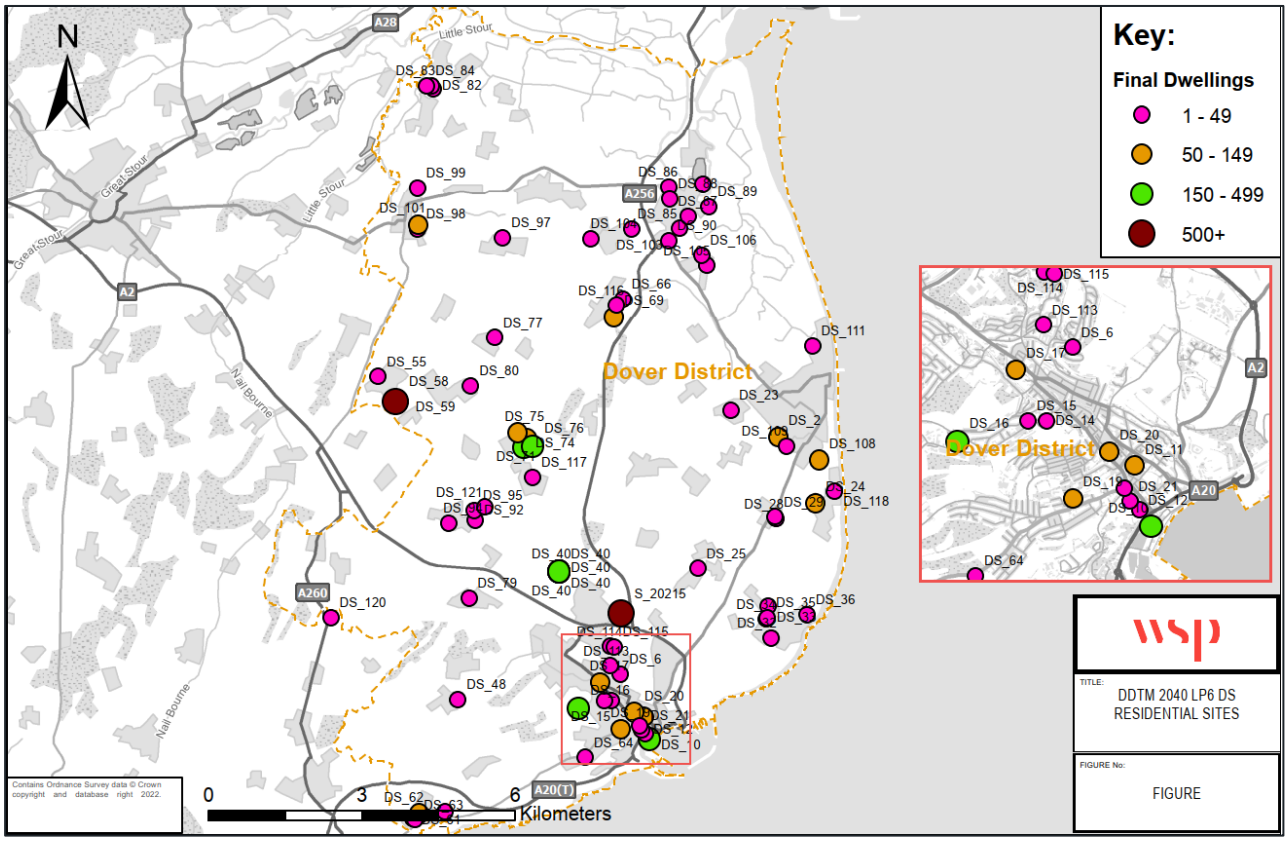


Figure 5-1: DDTM Do Something, Residential - Dover Local Plan Regulation 19 Allocations

5.2.5. Figure 5-1 highlights that 70 of the potential residential sites in the Dover and Deal area consist of less than 100 dwellings. Most of these smaller sites of 100 dwellings or less sit close to the A256 and tie in at the A256/ Deal Road roundabout to the north and Whitfield interchange to the south.

5.2.6. There are seven potential sites with over 500 dwellings, these are deemed to be the most significant in size and their impacts will be monitored closely; six are in the Whitfield area (representing the different neighbourhoods of the proposed Whitfield development) and these sites will supply 2,000 and 4,930 additional dwellings in the DS1 and DS2 scenario. Specific network detail has been incorporated within Whitfield that is proposed to support significant development in this area; the network changes are discussed in more detail in paragraph 5.2.17.

5.2.7. DS_58 is a site in Aylesham which proposes 640 homes. As the location of the site is outside the DDTM detailed area of modelling, the impacts of this potential allocation will be assessed in more detail within a localised excel model, discussed within Chapter 9.

5.2.8. Modelling the Do Something scenario allows for comparisons against the Do Minimum network and conclusions to be drawn as to whether mitigation on the road network may be necessary as a result of the extra trips from the potential allocations loaded onto the road network.

Regulation 19 Employment Allocations

5.2.9. The Dover Local Plan DS scenario includes 4 potential employment sites which could deliver 4,591 jobs; the locations of which are displayed in Figure 5-2. Similar to residential developments, sites with fewer than 100 jobs are indicated by a small pink circle; trip generation from these sites is added to the existing polygon within which the site is located. Potential site allocations with greater than 100 jobs, shown by the orange, green and brown circles depending on their size, have been modelled explicitly and their trip generation has been added to a unique zone representative of that development only.

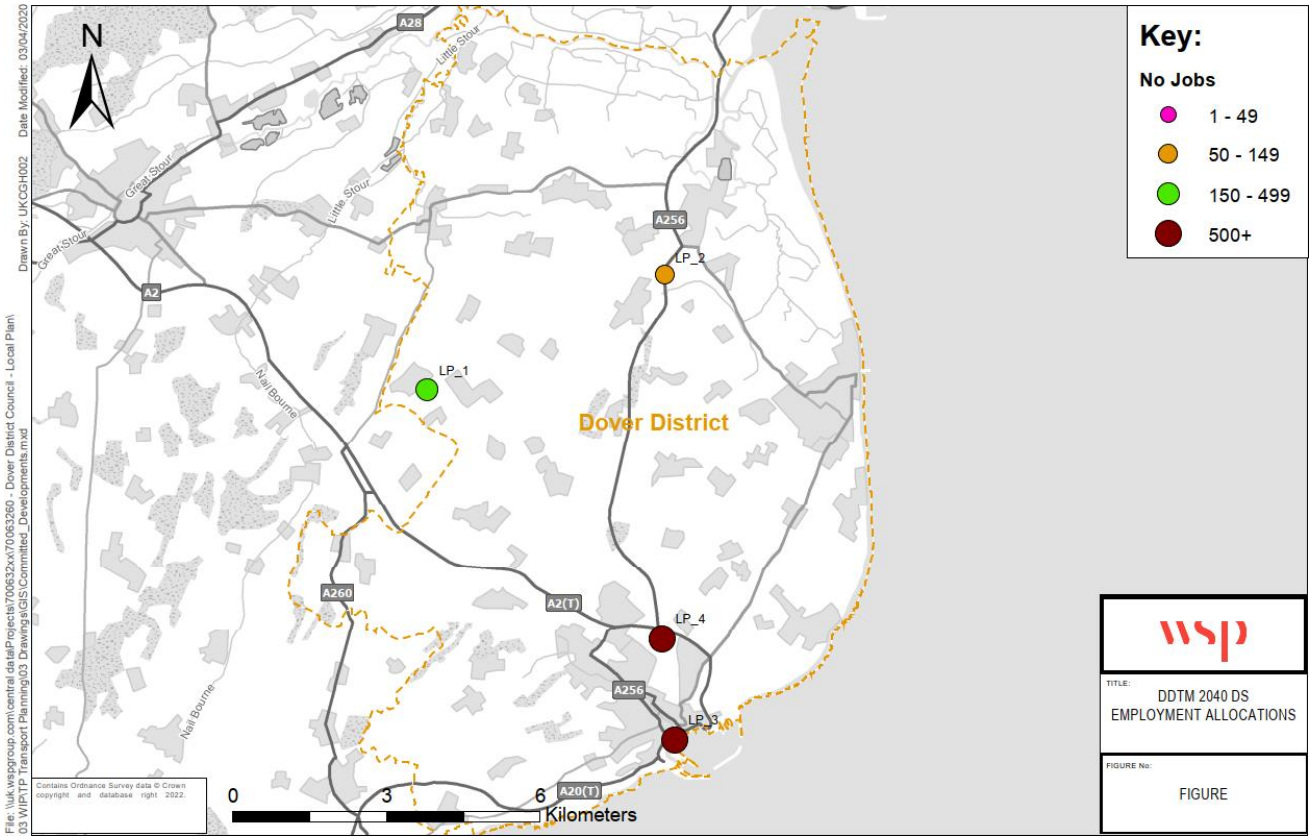


Figure 5-2: DDTM Do Something, Employment - Dover Local Plan Regulation 19 Allocations

5.2.10. The Local Plan site that is forecast to provide the most jobs is White Cliffs Business Park Phases I-III, displayed as LP_4 on the map; this site will provide 3,569 jobs based on the land use split of B1a, B1c, B2 and B8. No specific infrastructure has been incorporated to support this development as it is considered that vehicles will access the business park from the existing Honeywood Parkway.

5.2.11. Details of the potential employment site size and land use split used to calculate the total jobs each site would provide is detailed in Table 5-3.

Table 5-3: DDTM DS Local Plan Regulation 19 Employment Site Details

	Site Ref	Development Potential	Land Uses / Split	Comments
LP_1	Aylesham Development Area	8,000sqm	B1/ B2	Split SQM equally between B1/B2
LP_2	Statenborough Farm Eastry	1,500sqm	B1/B2/B8	Split SQM equally between B1, B2 and B8
LP_3	Dover Waterfront	1,104sqm	B1/C1	Majority of SQM B1 (1,014) and C1
LP_4	White Cliffs BP	85,000sqm	B1/B2/B8	Split between B1, B2 and B8

5.2.12. The potential Local Plan employment site allocations within the Do Something are listed in detail within Appendix K, in separate document.

Regulation 19 Windfall Sites

5.2.13. It was agreed with DDC that there would be a future windfall of 1,120 dwellings that would gain permission between 2021 and the 2040 forecast year. This forms part of the total dwellings assumed as part of DS1 and DS2. As these sites have not yet gained permission, the exact location of this growth was unknown. As such the location of historical windfall sites was used as a basis to predict where future sites could come forward.

5.2.14. Figure 5-3 presents the zonal plan of where the windfall sites have been assumed.

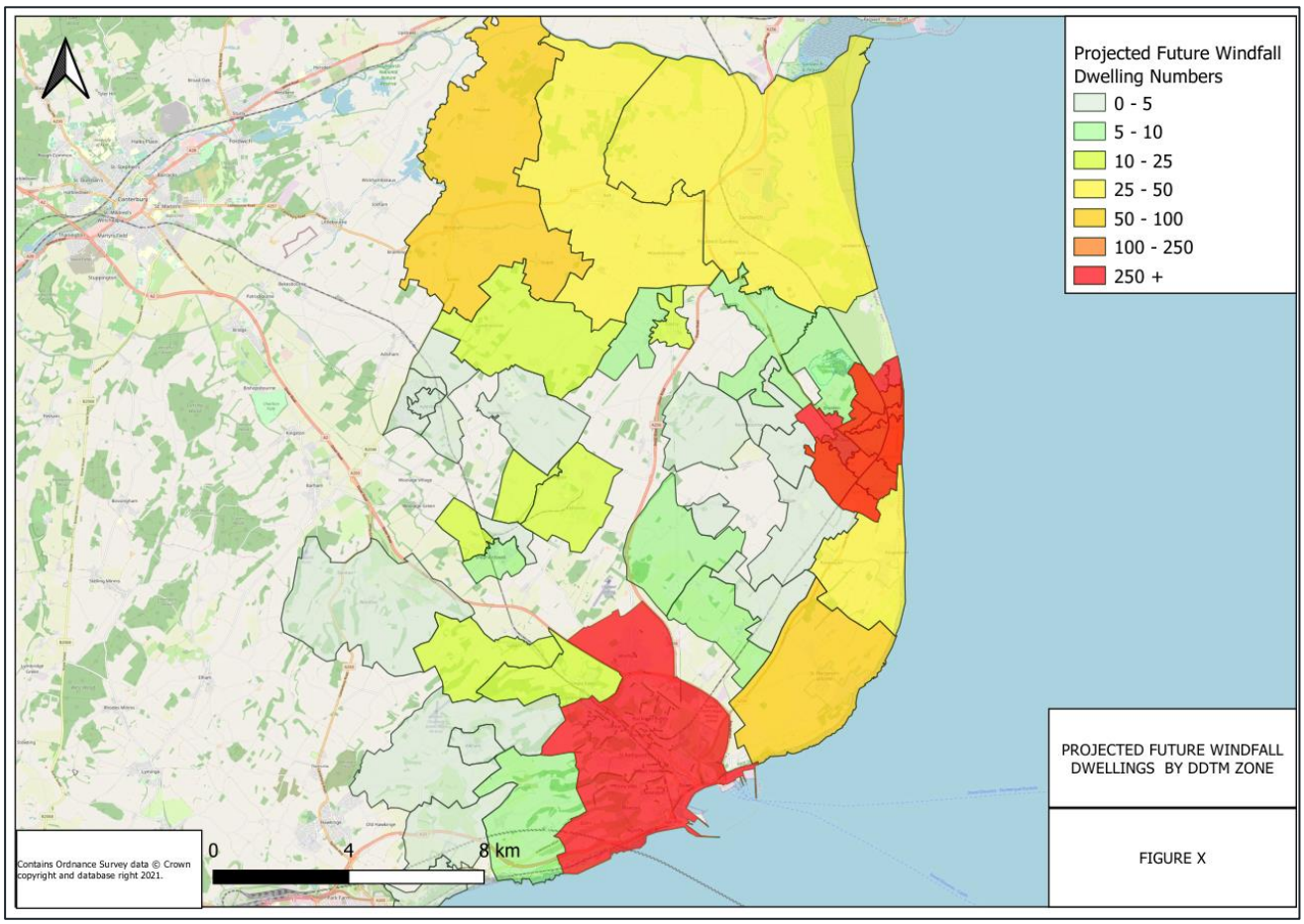


Figure 5-3: Do Something projected Future Windfall

Network Assumptions

5.2.15. The Do Something will use the Do Minimum network as a base network, with completed and consented infrastructure changes incorporated. The Do Something model will also include the specific access points for explicitly modelled developments listed in Table 4-2 and the Whitfield and Duke of York roundabout improvements are also incorporated.

5.2.16. Additional network detail will be added to the Do Something scenario to reflect the infrastructure proposed to be associated with explicitly modelled Local Plan sites – potential site allocations with greater than 100 households or jobs.

Explicitly Modelled Sites

5.2.17. As with the Do Minimum, potential site allocations with greater than 100 dwellings or jobs have been modelled explicitly. Trip generation from explicitly modelled developments is added to a new model zone that has been created to represent a single specific site; this allows for more detailed analysis of the transport impacts of a particular site, and the access/egress to the existing highway network will reflect allocation proposals.

5.2.18. Table 5-4 details residential explicitly modelled developments in the Do Something scenario.

Table 5-4: 2040 Do Something Scenario, Explicitly Modelled Potential Housing Allocations

WSP ID	App Number	Site Address	No of HHs	Associated Infrastructure
DS_10	DOV017	Dover Waterfront	263	Access onto Cambridge Road, Waterloo Crescent
DS_16	DOV022E	Land in Coombe Valley, Dover	220	Priority junction with Barwick Road
DS_17	DOV023	Buckland Mill, Dover	124	Priority junction with Crabble Hill
DS_40	WHI001	WUE	2,000/ 4,930	Access via the proposed Whitfield development road
DS_58	AYL003	Land to the south of Spinney Lane, Aylesham	640	Access onto Spinney Lane and Aylesham Road
DS_74	EYT003	Land adjoining Terrace Road, Elvington	150	Access onto Adelaide Road, south of Terrace Road
DS_76	EYT009	Land to the east of Terrace Road, Elvington	150	Access onto Adelaide Road, south of Terrace Road
DS_122	ASH000	Ash Neighbourhood Plan	196	Outside detailed model area

Whitfield Urban Expansion

5.2.19. The Do Something Local Plan scenarios include the build-out of the remaining extant permission, totalling approximately an additional 539 dwellings to be located within Phase 1/1A and accessing the existing highway network via the A256 at grade junction, incorporated as part of the Do Minimum scenario.

5.2.20. To support the additional growth within and around Whitfield (WHI001 and WHI008), a development road is proposed around the north of the existing village with interconnecting junctions at A2, Singledge Lane, Sandwich Road, Napchester Road, Church Whitfield Road, Archer's Court Road and the A256.

5.2.21. Coding of the development road has been based upon an indicative alignment following discussion with DDC and the developer. There will be a new roundabout on A2 west of Whitfield roundabout which provides access to the development spine road which travels north to Sandwich Road. On A256 a new roundabout will be built to replace the current junction with Sandwich Road. The development spine road continues south-east wards from Sandwich Road joining back onto A256 at the Richmond Way roundabout.

5.2.22. To limit rat running traffic using the development spine road, there will be closures and banned turns on existing roads, this includes:

- Closure to Napchester Road between Sandwich Road and Spine Road
- Closure of Archers Court Road between Cranleigh Drive and Spine Road

- Closure of Church Whitfield Road detailed by the green route in Figure 2.1
- Proposed Fast Track bus spine road will only permit bus traffic

5.2.23. Figure 5-4 shows the inclusion of the infrastructure associated with Whitfield Urban Expansion and how it has been incorporated into the Do Something models.



Figure 5-4: Whitfield Urban Expansion, Associated Infrastructure, Do Something Scenario

5.2.24. Table 5-5 details employment explicitly modelled developments in the Do Something scenario.

Table 5-5: 2040 Do Something Scenario, Explicitly Modelled Regulation 19 Employment Allocations

WSP ID	App Number	Site Address	No of Jobs	Associated Infrastructure
LP_1		Aylesham Development Area	267	Access onto Aylesham Road
LP_3		Dover Waterfront	685	Access onto Cambridge Road, Waterloo Crescent
LP_4		WCBP Total	3,569	Access onto existing roundabouts along Honeywood Parkway

Trip Rates and Trip Generation

5.2.25. The trip rates for each land use have been derived from the TRICS database and have been applied to the potential site allocations to determine the trip generation. These are presented in Table 4-5; the full output from TRICS can be seen in Appendix H, in separate document.

5.2.26. A detailed breakdown of trip generation for the Do Something Residential and Employment sites is included in Appendix L, in separate document.

5.2.27. Table 5-6 and Table 5-7 illustrates the total additional residential and employment trips added to the Do Something networks for the DS1 and DS2 scenario respectively. This was to enable the impacts of the full list of sites in this scenario to be assessed.

Table 5-6: Do Something 1, Regulation 19 Local Plan Allocations, Net Trip Generation

Development Type	AM Two Way	PM Two Way
Residential	3,288	3,568
Employment	930	854
Total	**4,218**	**4,422**

Table 5-7: Do Something 2, Regulation 19 Local Plan Allocations, Net Trip Generation

Development Type	AM Two Way	PM Two Way
Residential	4,626	5,022
Employment	930	854
Total	**5,556**	**5,876**

Trip Distribution

5.2.28. The additional trips resulting from the sites in this scenario were added to existing zones and followed the same zonal distribution of the existing model; explicitly modelled zones copied the distribution from nearby zones of a similar size and land use.

Matrix Totals

5.2.29. Table 5-8 and Table 5-9 compare the matrix totals in PCUs for the AM and PM peaks in the 2040 Do Something scenarios and makes a comparison to the 2015 base year matrix and the 2040 Do Minimum.

Table 5-8: 2040 Do Something Scenario 1 Matrix Total Comparison

Scenario	Base Year	Do Minimum	Local Plan Development	Final Matrix Total	Difference DS vs Base
AM Peak	36,314	44,029	4,218	48,247	11,933
PM Peak	32,645	40,097	4,422	44,519	11,874

Table 5-9: 2040 Do Something Scenario 2 Matrix Total Comparison

Scenario	Base Year	Do Minimum	Local Plan Development	Final Matrix Total	Difference DS vs Base
AM Peak	36,314	44,029	5,556	49,585	13,271
PM Peak	32,645	40,097	5,876	45,973	13,328

5.3 Summary

5.3.1. WSP have developed two Do Something scenarios representing Dover District Councils Local Plan Regulation 19 sites. The Do Something 1 includes a growth of 7,195 dwellings and 4,591 jobs and the Do Something 2 includes a growth of 10,125 dwellings and 4,591 jobs compared to the Do Minimum.

5.3.2. The impacts of the Do Minimum and Do Something AM and PM peak models has been presented in detail within Chapter 6 with comparisons made between the forecast scenarios at the 2015 DDTM base model.

6

Results

PUBLIC

6 Results

6.1 Introduction

6.1.1. This chapter presents the results of the forecast 2040 DDTM assignments providing network statistics, impacted junctions and links and convergence of the forecast scenarios, with and without the Local Plan allocations, in the forecast year (2040). The performance of the forecast assignments has been considered as follows:

- Impact of completed and consented growth (DM – Base);
- Impact of Regulation 19 Local Plan sites without junction improvements at Whitfield and Duke of York (Do Something No Mitigation) and;
- Impact of Regulation 19 Local Plan sites with junction improvements at Whitfield and Duke of York (Do Something with Mitigation)

6.1.2. These impacts are considered in terms of actual flow and percentage flow changes. Flow difference plots have been produced to demonstrate the volume of vehicle comparisons between the 2015 base year, 2040 Do Minimum and 2040 Do Something, and any re-routing that occurs as a result of the forecast growth or implementation of the Local Plan sites.

6.1.3. A volume over capacity assessment has also been undertaken on links and junctions within the DDTM study area to further understand the level of impacts experienced, and whether they are benefits or adverse. It is worth noting that volume over capacity is a high-level indication of which junctions or links may operate over capacity in the forecast scenario. The methodology surrounding this is discussed later within this Chapter.

6.2 Model Convergence

6.2.1. Each user class is assigned over a number of iterations until a level of stability or 'convergence' is achieved. The DfT TAG-recommended convergence criteria, which is pre-set set within VISUM, is set out in Table 6-1.

Table 6-1: TAG Convergence Criteria

Measure of Convergence	Acceptable Value
'Delta'	Less than 1%
Percentage of links with flow changes < 5% ('P')	Four consecutive iterations greater than 90%

6.2.2. The maximum number of 'assignment iterations' has been set to 100 for each transport system, since the majority of models should converge within this range. For the Car element these represent the 'inner' iterations within each overall 'Assignment with ICA' iteration. For the Car assignment VISUM does not assess the 'P' statistic in terms of percentage change

in link flows; rather it assesses the difference in flows on a turn basis in terms of the GEH and reports the percentage of turns with flow changes less than a GEH value of 1.

Do Minimum

6.2.3. The results of the Do Minimum assignments are shown in Table 6-2 and Table 6-3 for the 08:00-09:00 and 17:00-18:00 models respectively. These demonstrate that the vehicle classes converge 'naturally' i.e. according to the settings defined within the model.

Table 6-2: 2040 Do Minimum Convergence, Results AM Peak

PrT System	'Delta'			Model Stability 'P'		
	Duality Gap	Iterations	n-3	n-2	n-1	n
All Vehicles	0.0000405	17	0.992	0.006	0.998	0.999

Table 6-3: 2040 Do Minimum Convergence, Results PM Peak

PrT System	'Delta'			Model Stability 'P'		
	Duality Gap	Iterations	n-3	n-2	n-1	n
All Vehicles	0.00008652	12	0.953	0.972	0.989	0.996

Do Something 1 No Mitigation

6.2.4. The results of the Do Something 1 without mitigation assignments are shown in Table 6-4 and Table 6-5 for the 08:00-09:00 and 17:00-18:00 models respectively. These demonstrate that the vehicle classes converge 'naturally' i.e. according to the settings defined within the model.

Table 6-4: 2040 Do Something 1 No Mitigation Convergence, Results AM Peak

PrT System	'Delta'			Model Stability 'P'		
	Duality Gap	Iterations	n-3	n-2	n-1	n
All Vehicles	0.00003896	16	0.982	0.996	0.993	0.998

Table 6-5: 2040 Do Something 1 No Mitigation Convergence, Results PM Peak

PrT System	'Delta'			Model Stability 'P'		
	Duality Gap	Iterations	n-3	n-2	n-1	n
All Vehicles	0.00006843	16	0.930	0.986	0.993	0.995

Do Something 1 with Mitigation

6.2.5. The results of the Do Something 1 with mitigation assignments are shown in Table 6-6 and Table 6-7 for the 08:00-09:00 and 17:00-18:00 models respectively. These demonstrate that the vehicle classes converge 'naturally' i.e. according to the settings defined within the model.

Table 6-6: 2040 Do Something 1 with Mitigation Convergence, Results AM Peak

PrT System	'Delta'			Model Stability 'P'		
	Duality Gap	Iterations	n-3	n-2	n-1	n
All Vehicles	0.00005297	14	0.994	0.997	0.999	0.999

Table 6-7: 2040 Do Something 1 with Mitigation Convergence, Results PM Peak

PrT System	'Delta'			Model Stability 'P'		
	Duality Gap	Iterations	n-3	n-2	n-1	n
All Vehicles	0.00007474	21	0.972	0.987	0.986	0.996

Do Something 2 No Mitigation

6.2.6. The results of the Do Something 2 No mitigation assignments are shown in Table 6-8 and Table 6-9 for the 08:00-09:00 and 17:00-18:00 models respectively. These demonstrate that the vehicle classes converge 'naturally' i.e. according to the settings defined within the model.

Table 6-8: 2040 Do Something 2 No Mitigation Convergence, Results AM Peak

PrT System	'Delta'			Model Stability 'P'		
	Duality Gap	Iterations	n-3	n-2	n-1	n
All Vehicles	0.00001164	24	0.995	0.993	0.999	0.998

Table 6-9: 2040 Do Something 2 No Mitigation Convergence, Results PM Peak

PrT System	'Delta'			Model Stability 'P'		
	Duality Gap	Iterations	n-3	n-2	n-1	n
All Vehicles	0.00002889	23	0.991	0.993	0.993	0.996

Do Something 2 with Mitigation

6.2.7. The results of the Do Something 2 with mitigation assignments are shown in Table 6-8 and Table 6-9 for the 08:00-09:00 and 17:00-18:00 models respectively. These demonstrate that the vehicle classes converge 'naturally' i.e. according to the settings defined within the model.

Table 6-10: 2040 Do Something 2 with Mitigation Convergence, Results AM Peak

PrT System	'Delta'			Model Stability 'P'		
	Duality Gap	Iterations	n-3	n-2	n-1	n
All Vehicles	0.00004050	17	0.992	0.996	0.998	0.999

Table 6-11: 2040 Do Something 2 with Mitigation Convergence, Results PM Peak

PrT System	'Delta'			Model Stability 'P'		
	Duality Gap	Iterations	n-3	n-2	n-1	n
All Vehicles	0.00007427	27	0.987	0.992	0.994	0.996

6.3 Do Minimum vs Base

6.3.1. Figure 6-2 and Figure 6-4 present the actual flow difference between the 2040 Do Minimum and 2015 Base DDTM in Dover in the AM Peak and PM Peak respectively. It is noted that these figures do not include labels and have instead been presented to show the broad patterns in flow increase / decrease and on which roads these occur. Some large increases are accredited to instances whereby new transport infrastructure has been coded into the Do Minimum scenario and as such all flow on a new link is therefore an increase. Figure 6-1 demonstrates in red the links where this is occurring in subsequent figures.

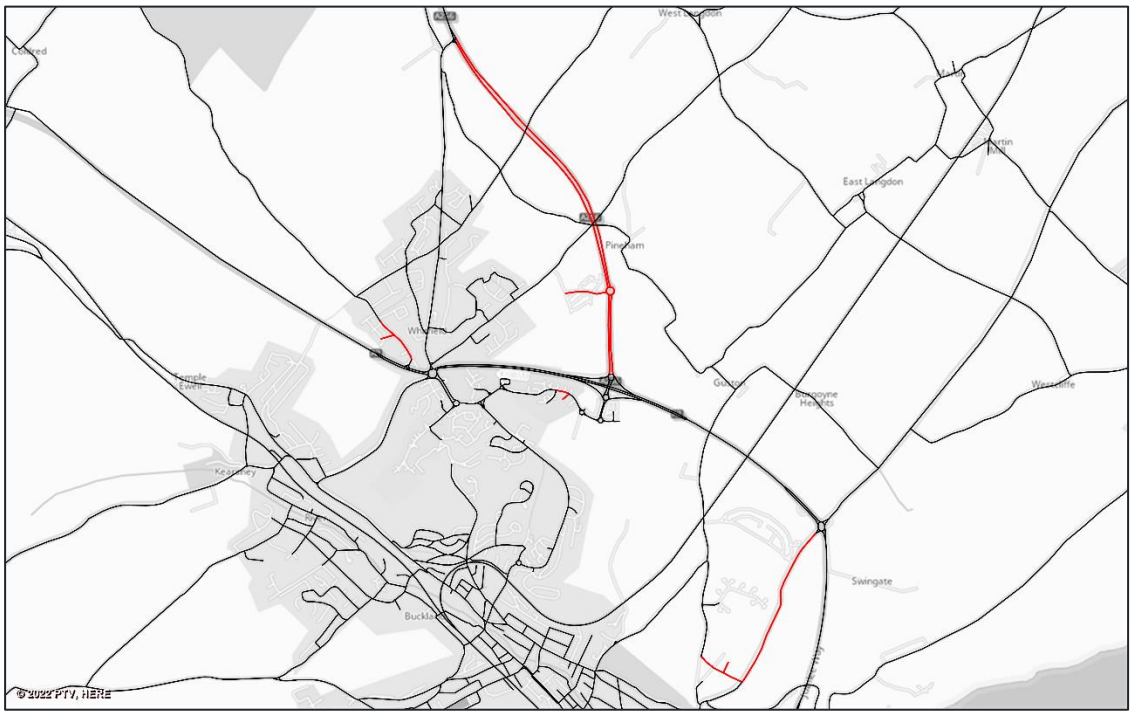


Figure 6-1: DDTM 2040 Do Minimum New Links

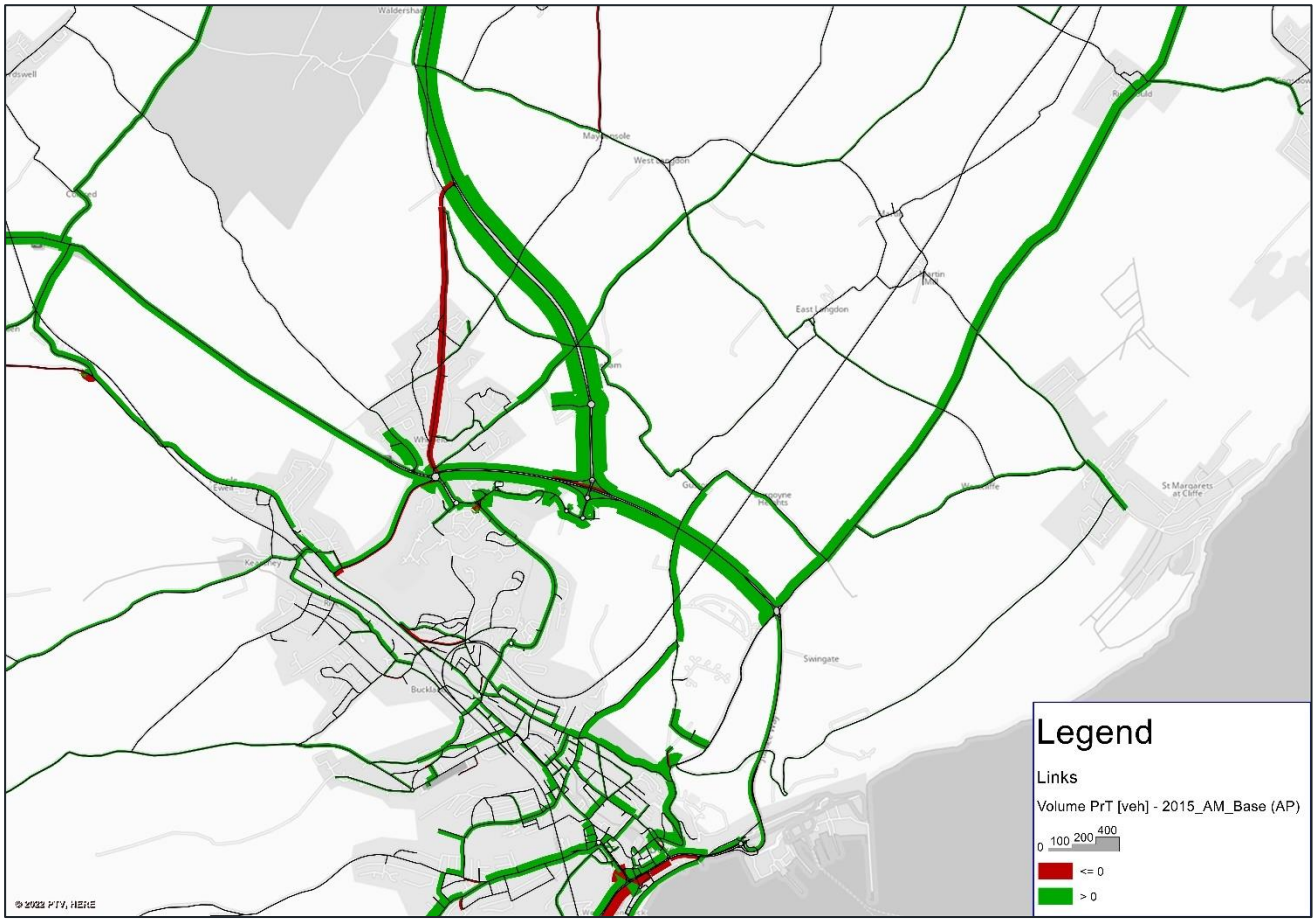


Figure 6-2: DDTM 2040 Do Minimum – Base Flow Difference, Dover, AM Peak

6.3.2. In the AM peak, flow reductions along the A20, close to the Port, are due to the implementation of signalised junctions at A20 / Union Street and A20 / A256 links being re-purposed in the Do Minimum coding.

6.3.3. Flow reductions along Sandwich Road can be seen in Figure 6-2 and are due to a change of routing away from Sandwich Road onto the A2/ A256 for vehicles routing from Whitfield Hill; these changes in the AM peak are presented in Figure 6-3.



Figure 6-3: Sandwich Road Northbound, 2015 Base (left) vs Do Minimum (right), AM Peak

6.3.4. Figure 6-2 shows an increased flow along Church Whitfield Road, Guston Road, and Dover Road in the AM peak; this is attributed to increased pressure on Whitfield Roundabout on the Sandwich Road approach and Duke of York roundabout on the A258 Deal Road approach. Vehicles are routing away from these roundabouts and instead utilising the 'attractive' less congested rural roads to access Dover town centre. Is it considered that suitable mitigation at Whitfield and Duke of York roundabouts would encourage these vehicles away from the rural routes and back onto the strategic routes, this is discussed further in this chapter.

6.3.5. Figure 6-4 presents the actual flow difference between the Do Minimum and the Base scenario, as with the AM peak similar trends in vehicle volume are present, flow reductions are present on Sandwich Road in both directions. Some vehicles are shown to route away from Sandwich Road and instead use Coldred Road to avoid Whitfield roundabout.

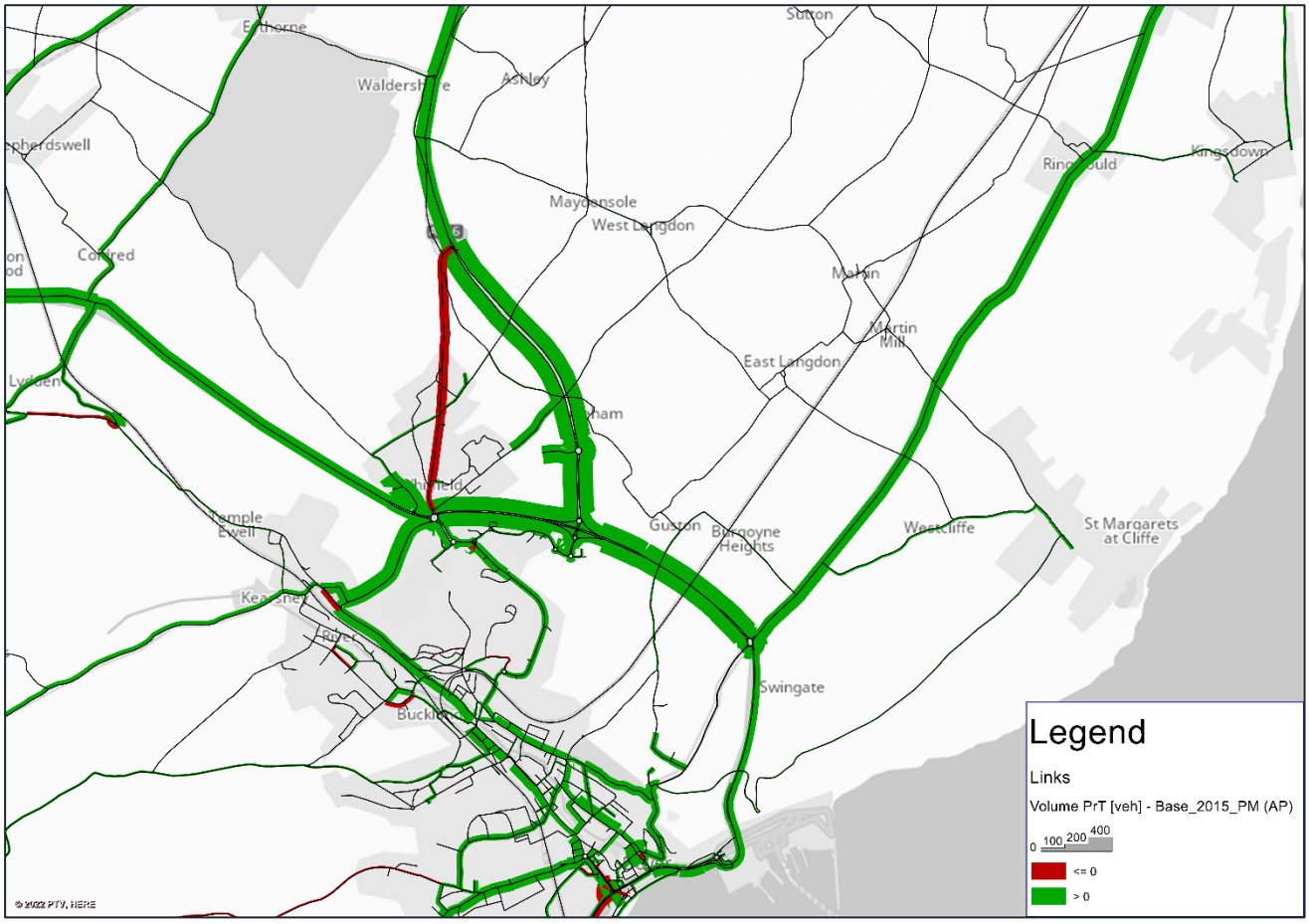


Figure 6-4: DDTM 2040 Do Minimum – Base Flow Difference, Dover, PM Peak

6.3.6. The PM peak presents less significant re-routing away from strategic routes onto rural routes than the AM peak and most reductions in flow (red bars) are accredited to minor localised re-routing. The impacts of the Do Minimum have been assessed in local junction models for Whitfield and Duke of York roundabouts and are discussed in more detail in Chapter 8.

6.3.7. Figure 6-5 and Figure 6-6 present the actual flow difference between the 2040 Do Minimum and 2015 Base DDTM in Deal in the AM Peak and PM Peak respectively. Generally, increases are seen across the network due to the inclusion of committed developments in Deal, with small decreases that are accredited to minor re-routing as a result of including localised committed development and other routes becoming more attractive, such around Walmer Station in the PM Peak.

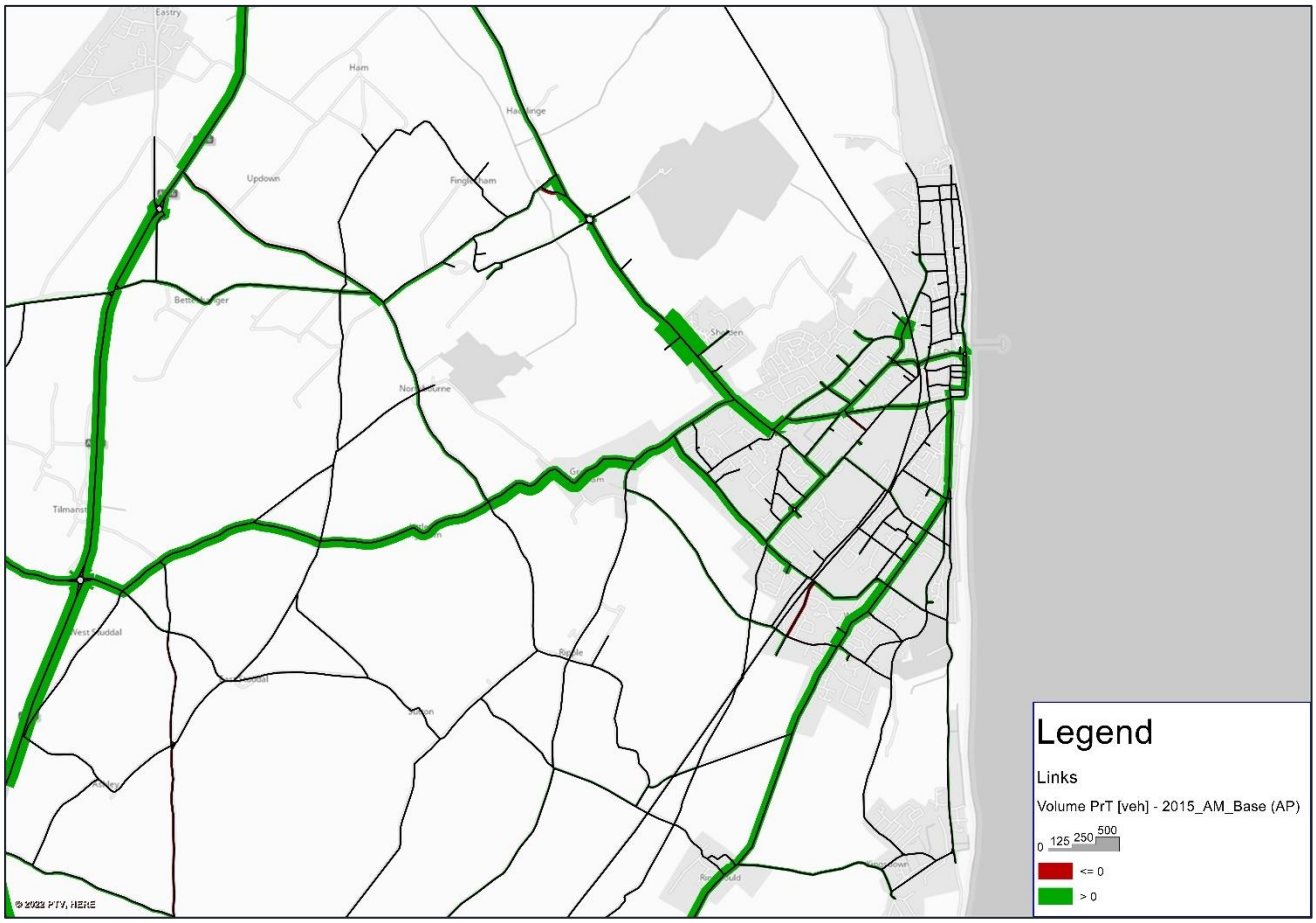


Figure 6-5: DDTM 2040 Do Minimum – Base Flow Difference, Deal, AM Peak

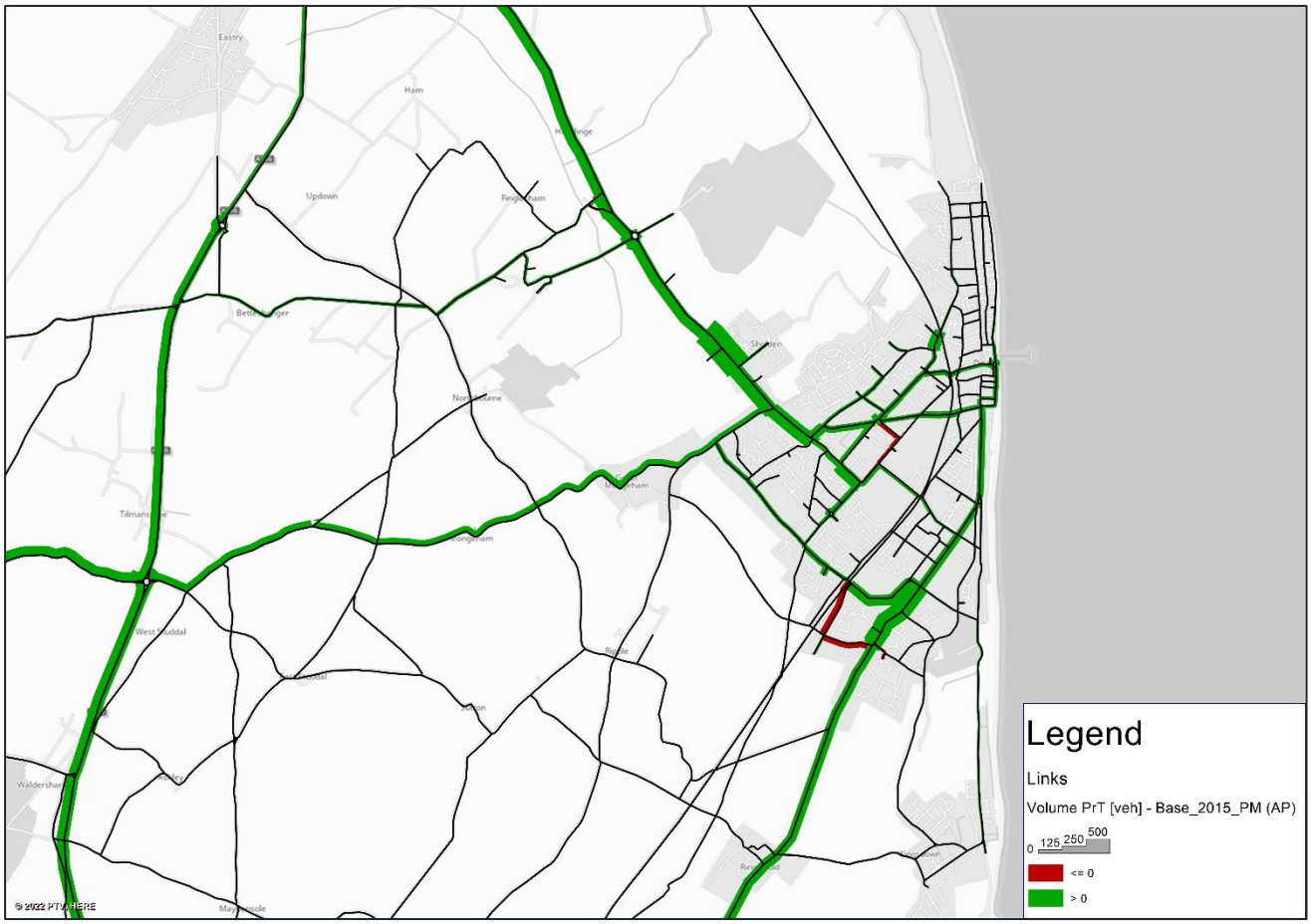


Figure 6-6: DDTM 2040 Do Minimum – Base Flow Difference, Deal, PM Peak

6.3.8. To determine the impacts of the 2040 Do Minimum scenario on key strategic junctions, actual flow and percentage flow differences are presented to demonstrate the arms with the most significant increases and decreases and to determine how this might impact the overall operation of the junction. The analysis has been undertaken on the following key junctions:

- Whitfield roundabout;
- Duke of York roundabout;
- London Road roundabout; and
- A256 Deal Road roundabout.

6.3.9. Figure 6-7 shows the actual flow increases at Whitfield Roundabout in the AM Peak; flows along the A2 increase by approximately 440 two-way vehicles east of the roundabout, and 350 two-way vehicles west of the roundabout. Flows along Honeywood Parkway increase by 260 two-way vehicles, some of which is accessing the new consented employment sites.

6.3.10. Decreases of approximately 95 southbound and 65 northbound vehicles are evident on Sandwich Road; the increase in vehicle volumes along the A2 main route through the junction is likely to make the Sandwich approach, for through-routing vehicles, increasingly unattractive and as such vehicles are re-routing via the A256 / A2 junction. There is a small

decrease in traffic on Whitfield Hill Road southbound of around 50 vehicles; this is due to southbound vehicles routing through Lydden instead of along the A2 and Whitfield Hill.

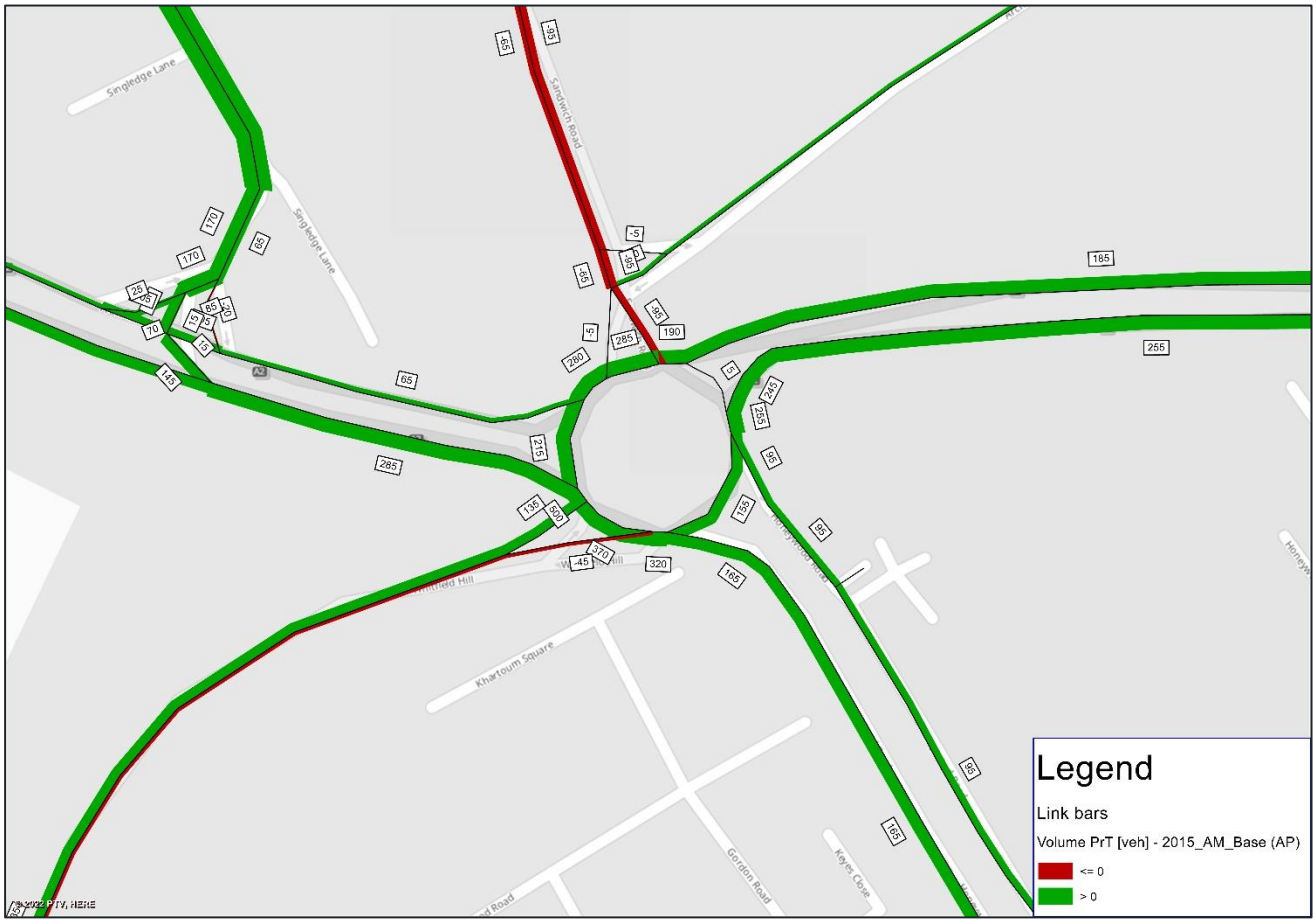


Figure 6-7: DDTM 2040 Do Minimum – Base Flow Difference, Whitfield Roundabout, AM Peak

6.3.11. Figure 6-8 shows the percentage flow increases at Whitfield Roundabout in the AM Peak and demonstrates an average increase of approximately 35% along the A2, given the 25-year growth period this is a growth of 1.4% per annum. Sandwich Road demonstrates a 15% reduction in traffic accessing the junction via this arm.

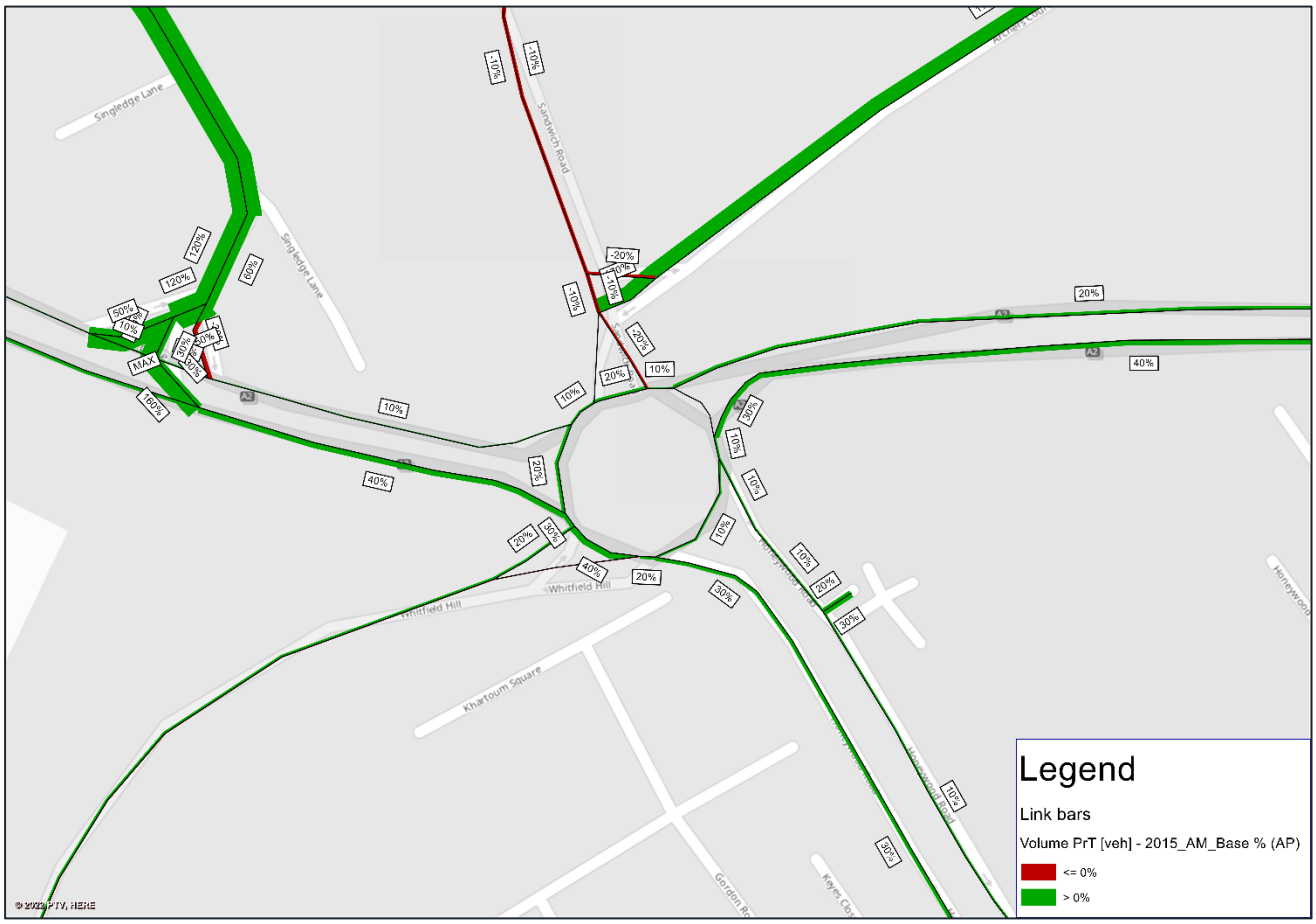


Figure 6-8: DDTM 2040 Do Minimum – Base % Flow Difference, Whitfield Roundabout, AM Peak

6.3.12. Figure 6-9 shows the actual flow increases at Whitfield Roundabout in the PM Peak; flows along the A2 increase by approximately 975 two-way vehicles east of the roundabout, and 395 two-way vehicles west of the roundabout. Flows along Honeywood Parkway increase by 305 two-way vehicles, predominantly northbound and likely flows leaving new employment sites. Similar to the AM peak, increases in flow on the major approaches to Whitfield leads to the re-routing of through routing vehicles previously using Sandwich Road onto the A256.

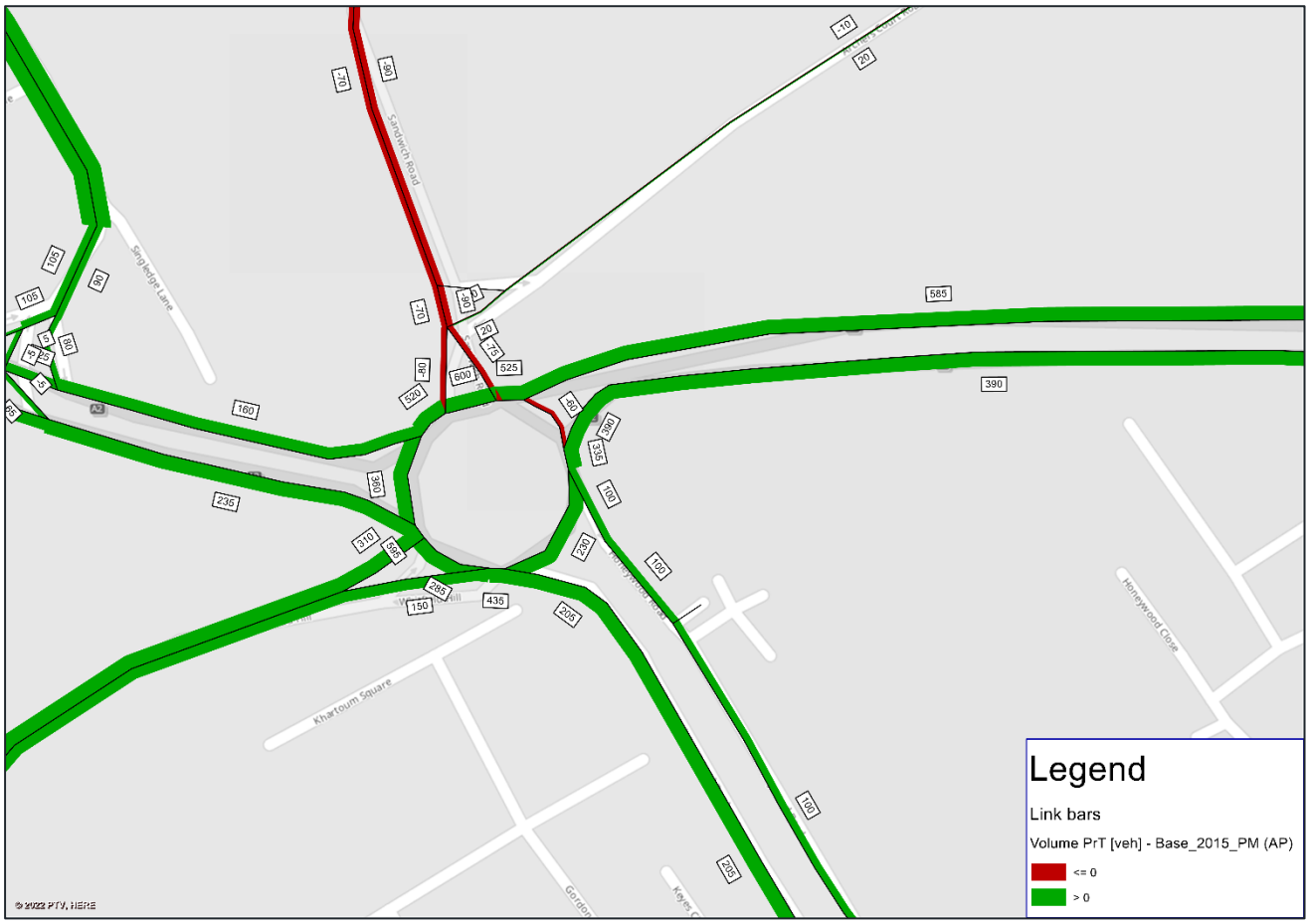


Figure 6-9: DDTM 2040 Do Minimum – Base Flow Difference, Whitfield Roundabout, PM Peak

6.3.13. Figure 6-10 shows the percentage flow increases at Whitfield Roundabout in the PM Peak and demonstrates an average increase of approximately 49% along the A2, given the 25-year growth period this is a growth of 2.0% per annum. Sandwich Road demonstrates a 15% reduction in traffic accessing and egressing via this arm.

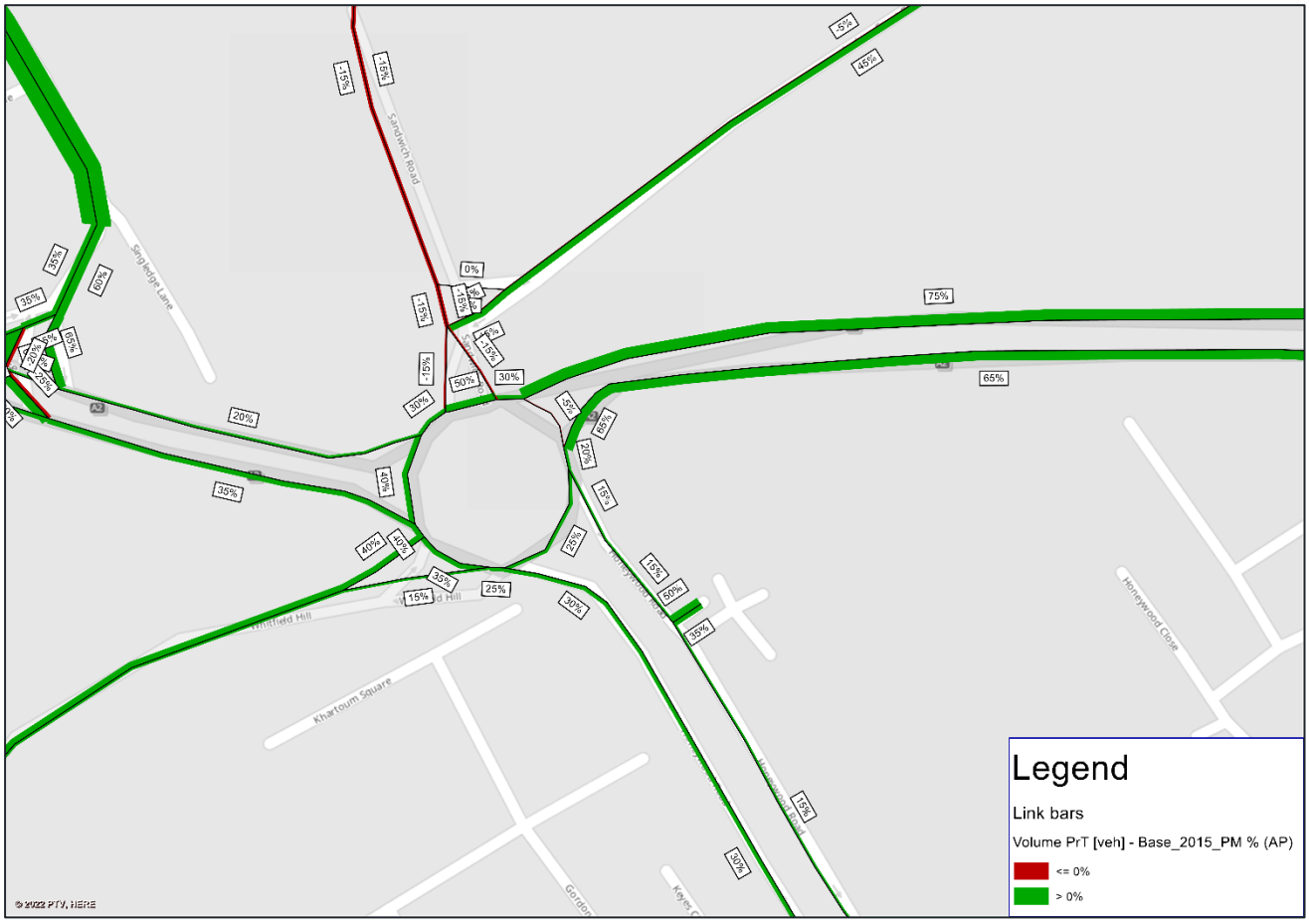


Figure 6-10: DDTM 2040 Do Minimum – Base % Flow Difference, Whitfield Roundabout, PM Peak

6.3.14. Figure 6-11 presents the actual flow increases at the Duke of York roundabout in the AM Peak; flows along the A2 increases by approximately 510 two-way vehicles west of the roundabout and 85 two-way vehicles south of the roundabout. Increases of 386 vehicles are shown on the A258 northbound which is accredited to a number of nearby developments choosing to route this way due to the more attractive journey time.

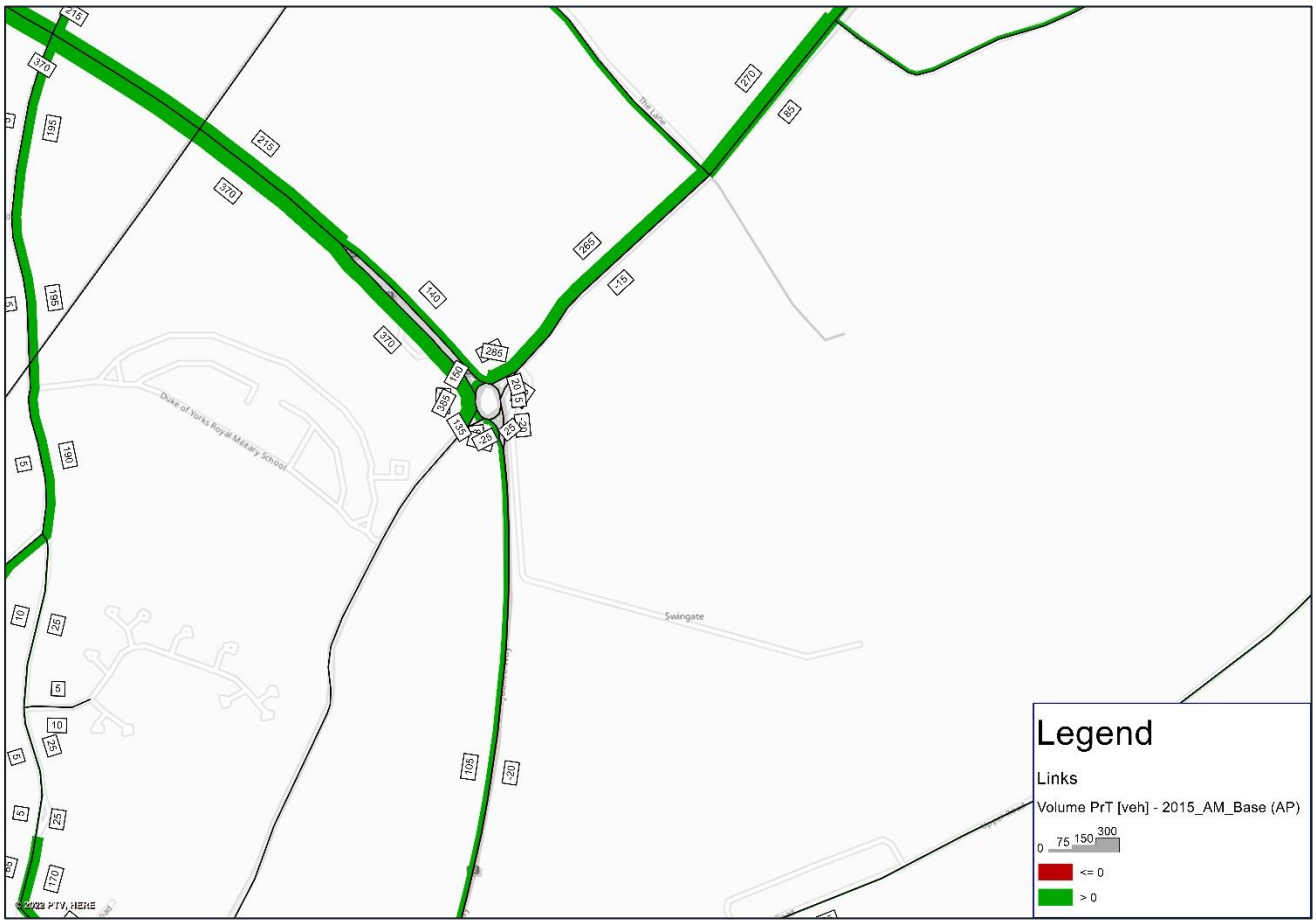


Figure 6-11: DDTM 2040 Do Minimum – Base Flow Difference, Duke of York Roundabout, AM Peak

6.3.15. Figure 6-12 shows the percentage flow changes at the Duke of York roundabout in the AM peak; flows on the A2 western increase by an average of 22% which is an annual growth of approximately 1.8% across the 25-year growth period. Flows along the A258 northbound, south of the A2, increase by 75% as a result of increased committed growth in Dover.

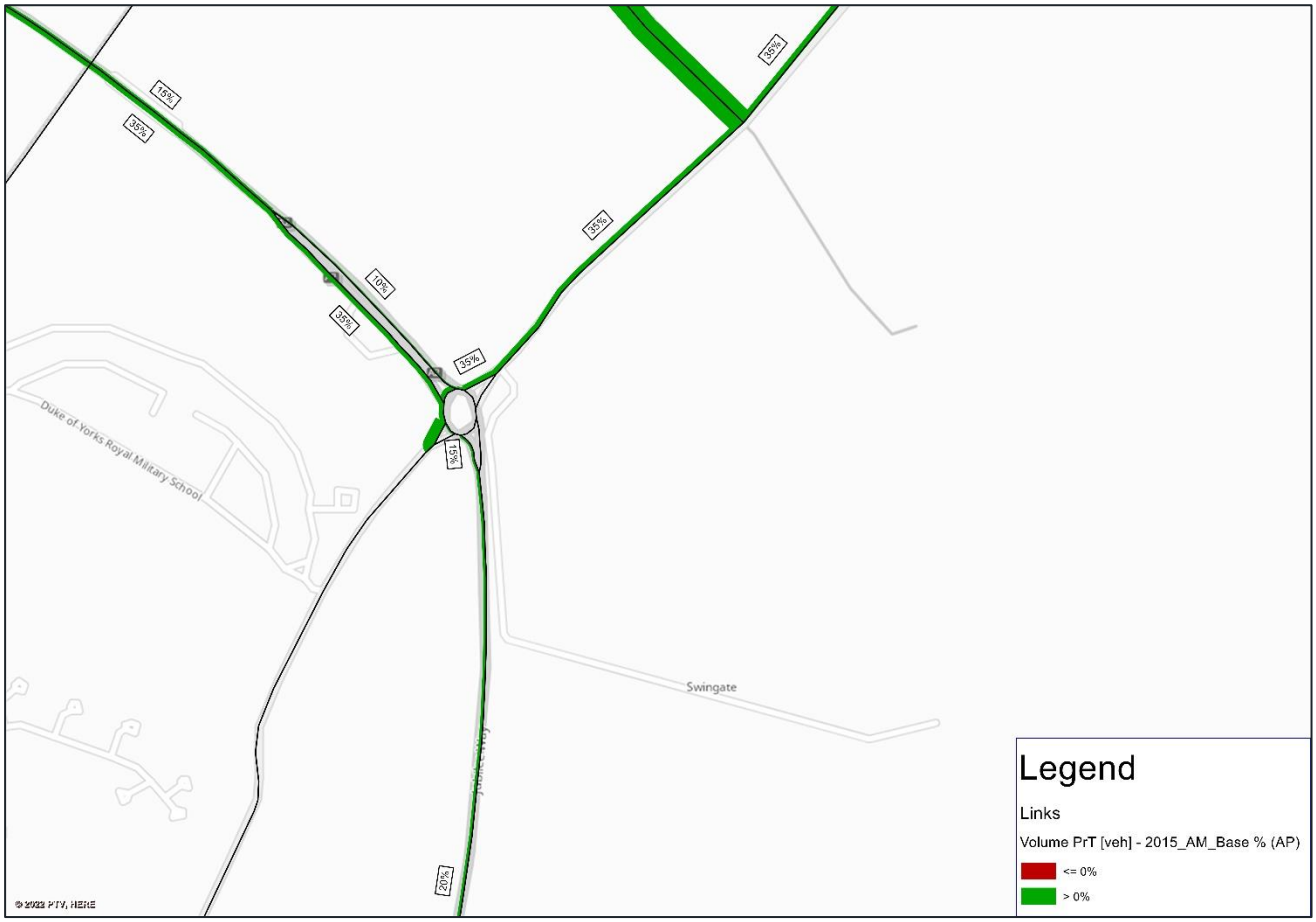


Figure 6-12: DDTM 2040 Do Minimum – Base % Flow Difference, Duke of York Roundabout, AM Peak

6.3.16. Figure 6-13 presents the actual flow increases at the Duke of York roundabout in the PM Peak; flows along the A2 increases by approximately 785 two-way vehicles west of the roundabout and 215 two-way vehicles south of the roundabout.

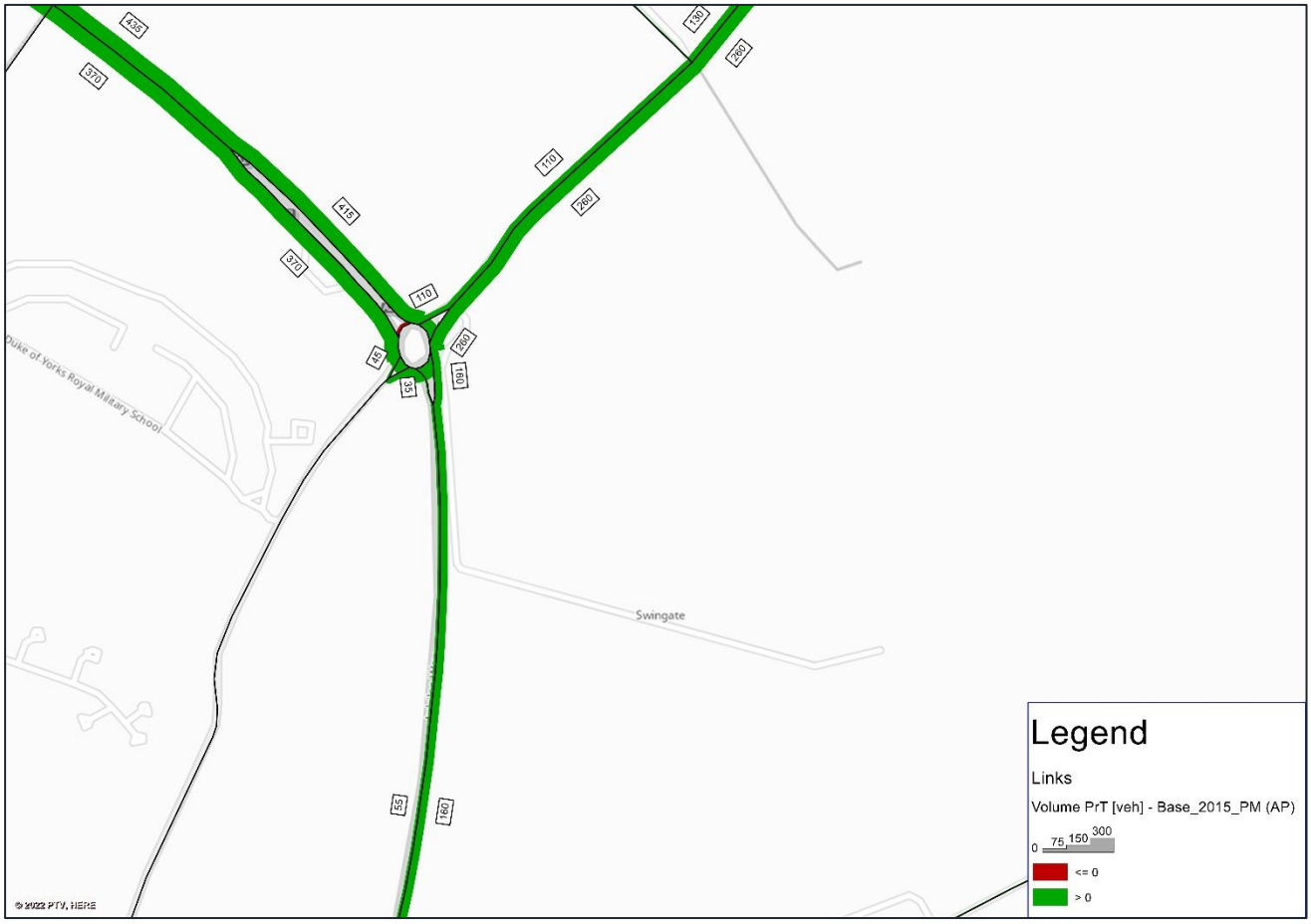


Figure 6-13: DDTM 2040 Do Minimum – Base Flow Difference, Duke of York Roundabout, PM Peak

6.3.17. Figure 6-14 shows the percentage flow changes at the Duke of York roundabout in the PM peak; flows along the A2 increase by an average of 34% which is an annual growth of approximately 1.4% across the 25-year growth period. Flows along the A258 southbound increase by an average of 45% or 1.8% per annum.

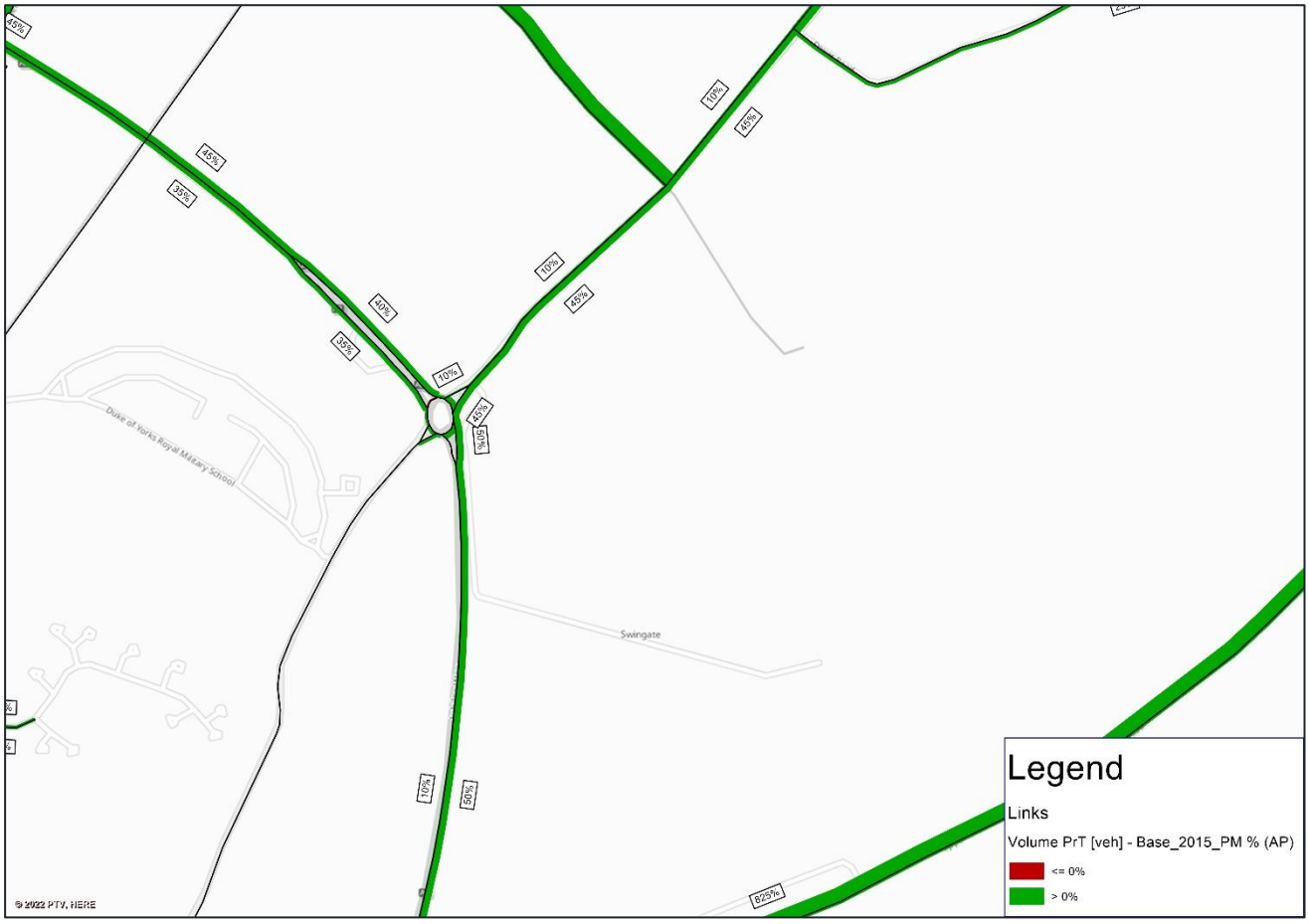


Figure 6-14: DDTM 2040 Do Minimum – Base % Flow Difference, Duke of York Roundabout, PM Peak

6.3.18. Figure 6-15 presents the actual flow differences at the London Road / Manor Road roundabout in Deal in the AM Peak; the figure shows increase on all approaches; the largest increases are on the London Road of approximately 505 two-way vehicles and less significant increases on Manor Road and small decreases on Rectory Road southbound. A proportion of this growth is accredited to committed developments north of Albert Road, both residential and commercial.

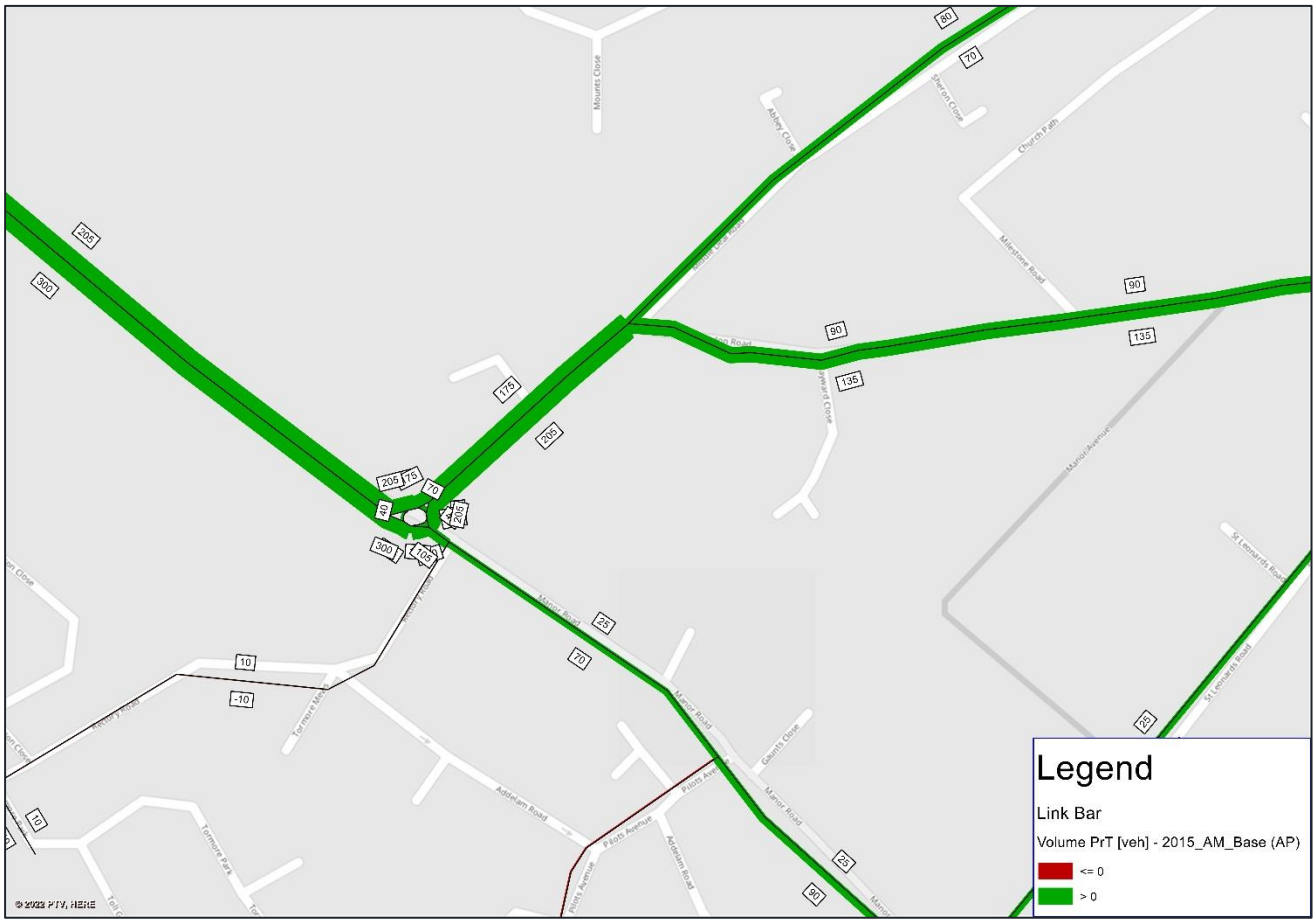


Figure 6-15: DDTM 2040 Do Minimum – Base -Flow Difference, London Road Roundabout, AM Peak

6.3.19. Figure 6-16 shows the percentage flow changes at the London Road / Manor Road roundabout in the AM peak; flows along London Road western approach increase by an average of 30% which is an annual growth of approximately 1.2% across the 25-year growth period.

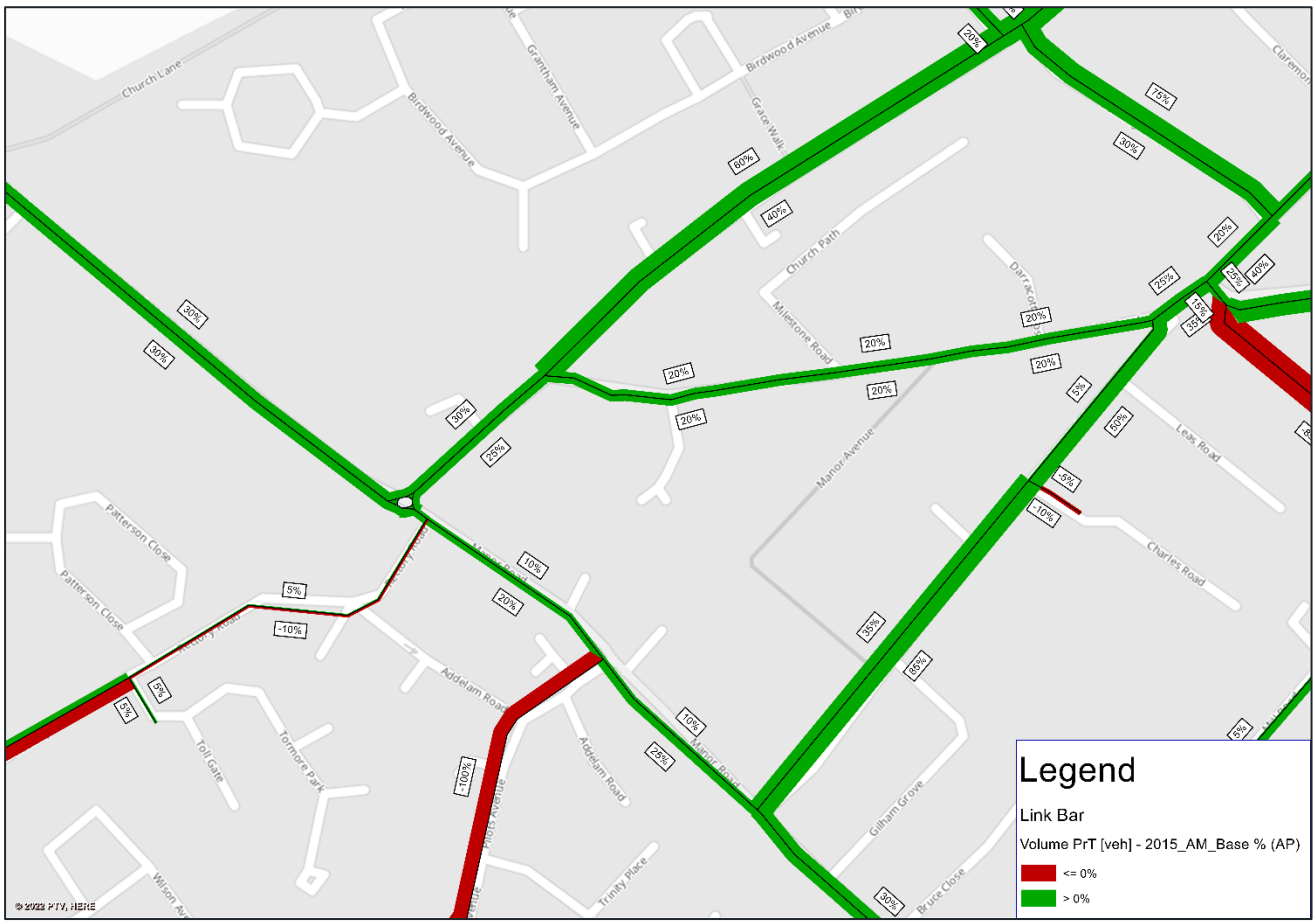


Figure 6-16: DDTM 2040 Do Minimum – Base % Flow Difference, London Road Roundabout, AM Peak

6.3.20. Figure 6-17 presents the actual flow differences at the London Road / Manor Road roundabout in Deal in the PM Peak; the figure shows increased flow on all approaches but predominantly on London Road of approximately 200 vehicles. Increases on Manor Road are approximately 195 two-way vehicles, with increases of 20 two-way vehicles on Rectory Road.

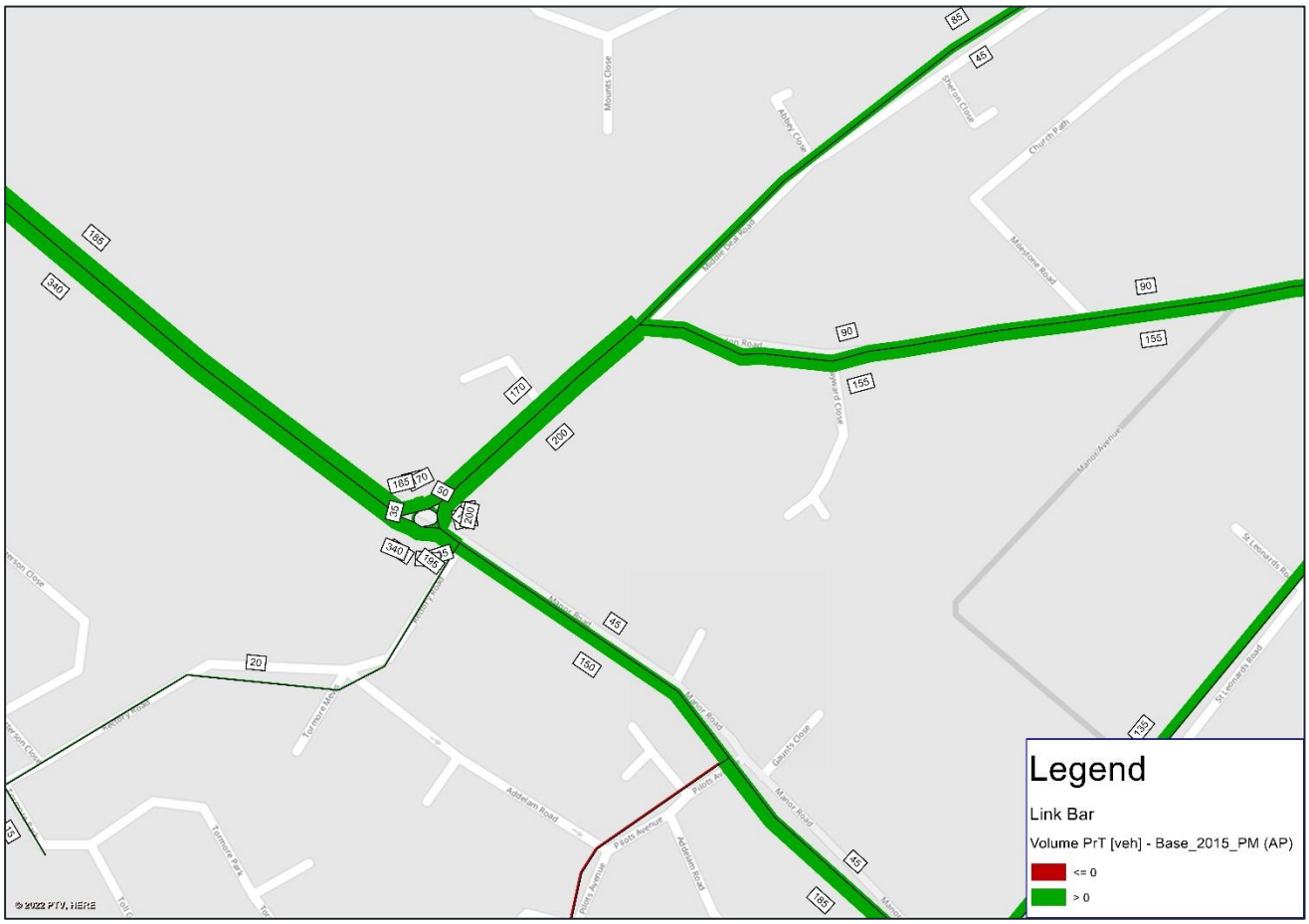


Figure 6-17: DDTM 2040 Do Minimum – Base Flow Difference, London Road Roundabout, PM Peak

6.3.21. Figure 6-18 shows the percentage flow changes at the London Road / Manor Road roundabout in the PM peak; flows along London Road increase by an average of 43% which is an annual growth of approximately 1.7% across the 25-year growth period. Flows along Rectory Road increase by 15% although it is noted that the volume of vehicles is relatively small.

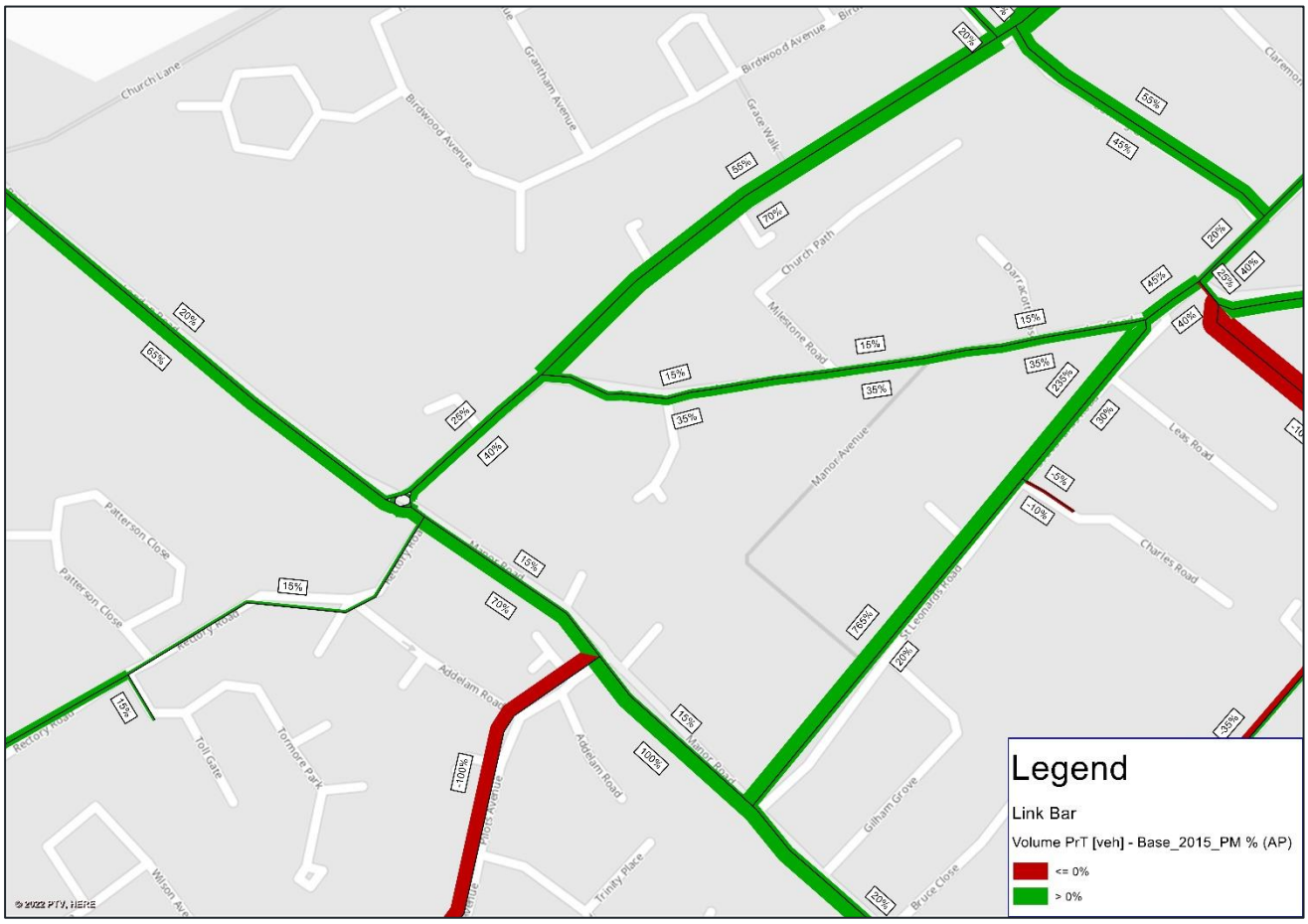


Figure 6-18: DDTM 2040 Do Minimum – Base % Flow Difference, London Road Roundabout, PM Peak

6.3.22. Figure 6-19 presents the actual flow difference at the A256/ Deal Road roundabout in Deal for the AM peak; the figure shows an increase of flows of approximately 300 vehicles northbound. There is a slight decrease of flows on the Deal Road approach of 15 vehicles.

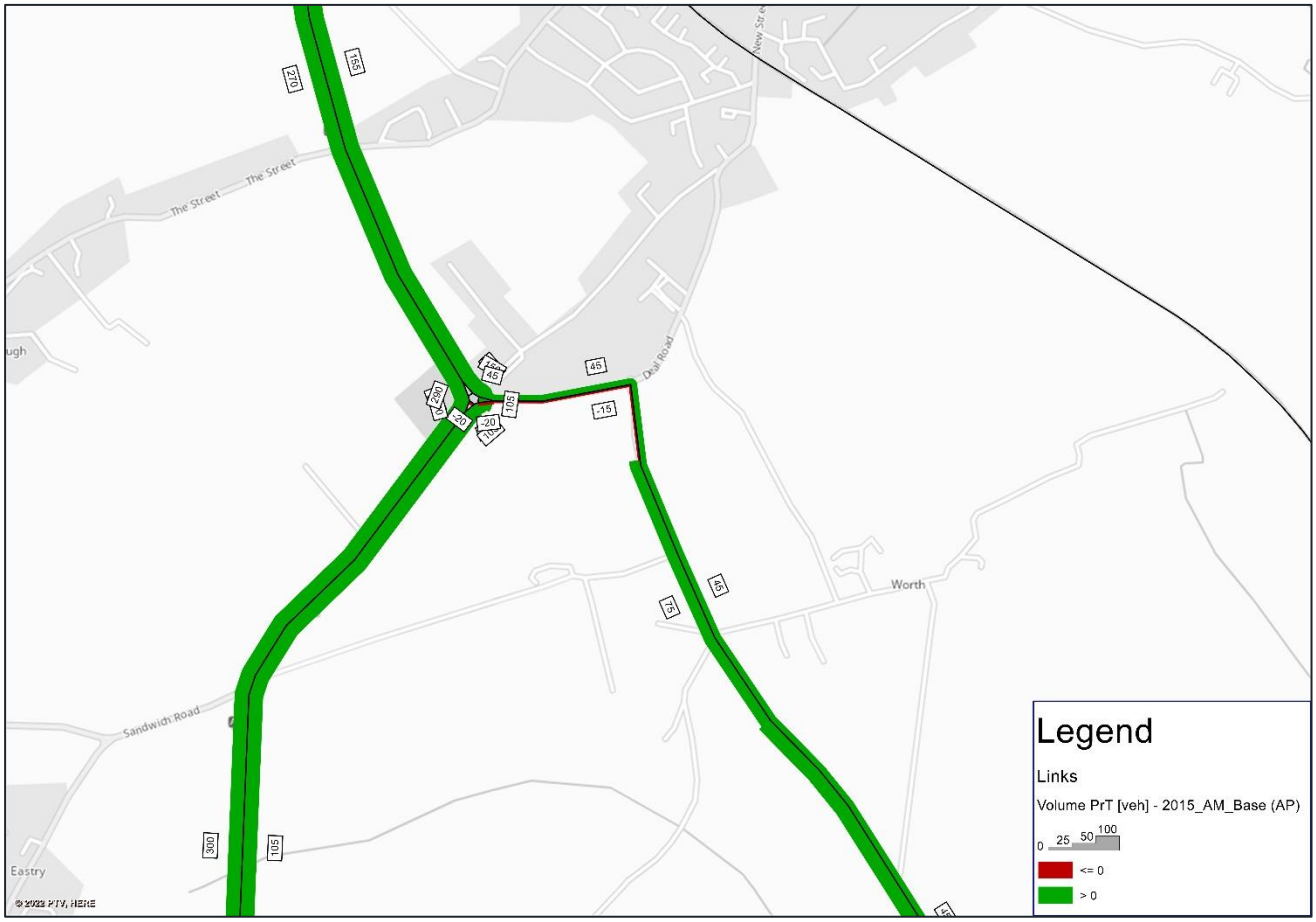


Figure 6-19: DDTM 2040 Do Minimum – Base Flow Difference, A256/ Deal Road Roundabout, AM Peak

6.3.23. Figure 6-20 shows the percentage flow change at the A256/ Deal Road roundabout in the AM peak; the figure shows an increase in along the A256 northbound of 45% which is an annual growth of approximately 1.8% across the 25-year growth period. The increase is likely due to the re-routing of through vehicles travelling via the A256.

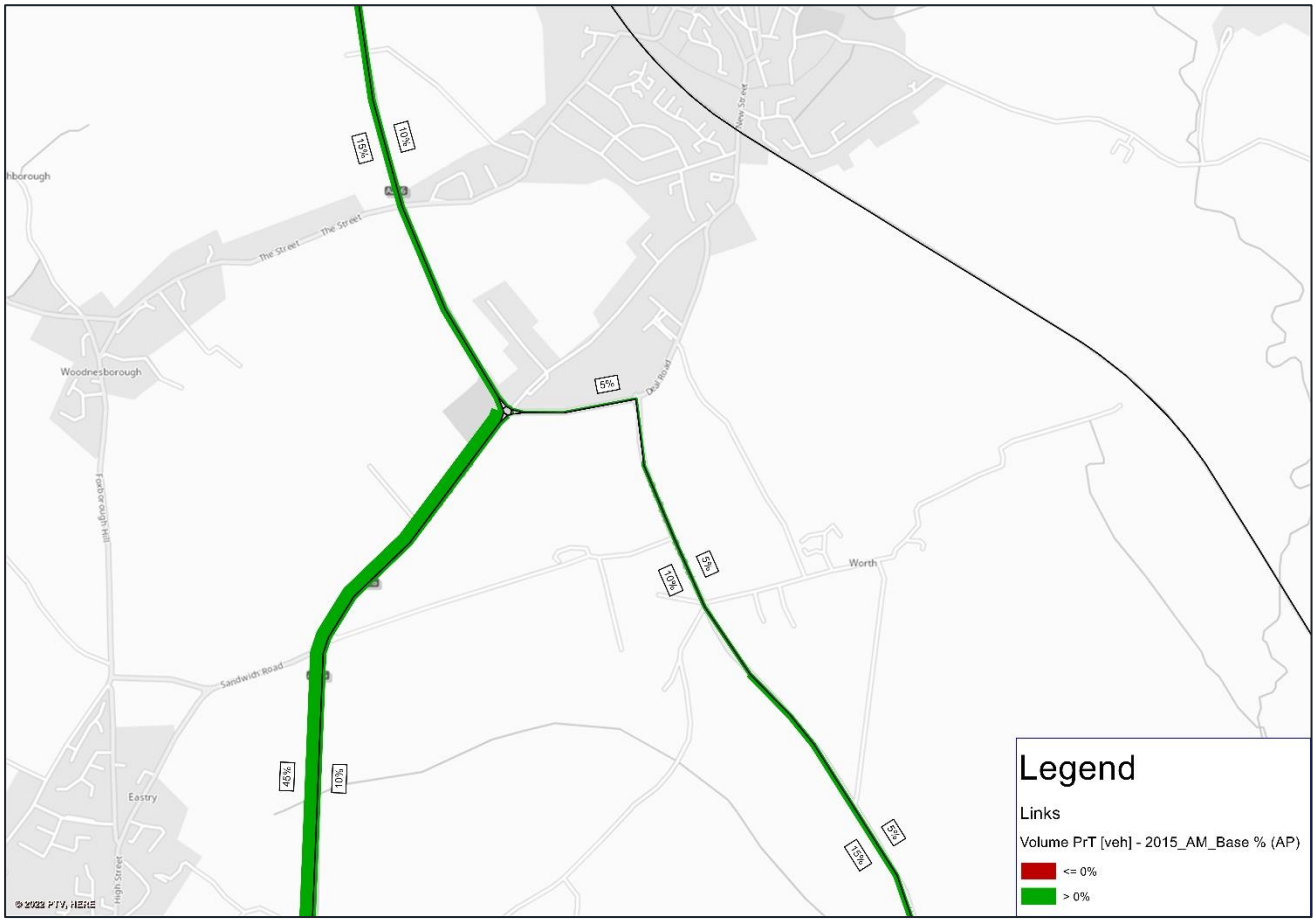


Figure 6-20: DDTM 2040 Do Minimum – Base % Flow Difference, A256/ Deal Road Roundabout, AM Peak

6.3.24. Figure 6-21 presents the actual flow difference at the A256/ Deal Road Roundabout in Deal for the PM peak; this shows an increase of flows entering the roundabout of approximately 40 – 330 vehicles. The flows on the exit arms highlight a significantly smaller increase in flows, with the exception of the A256 southbound that has a decrease of approximately 40 flows.

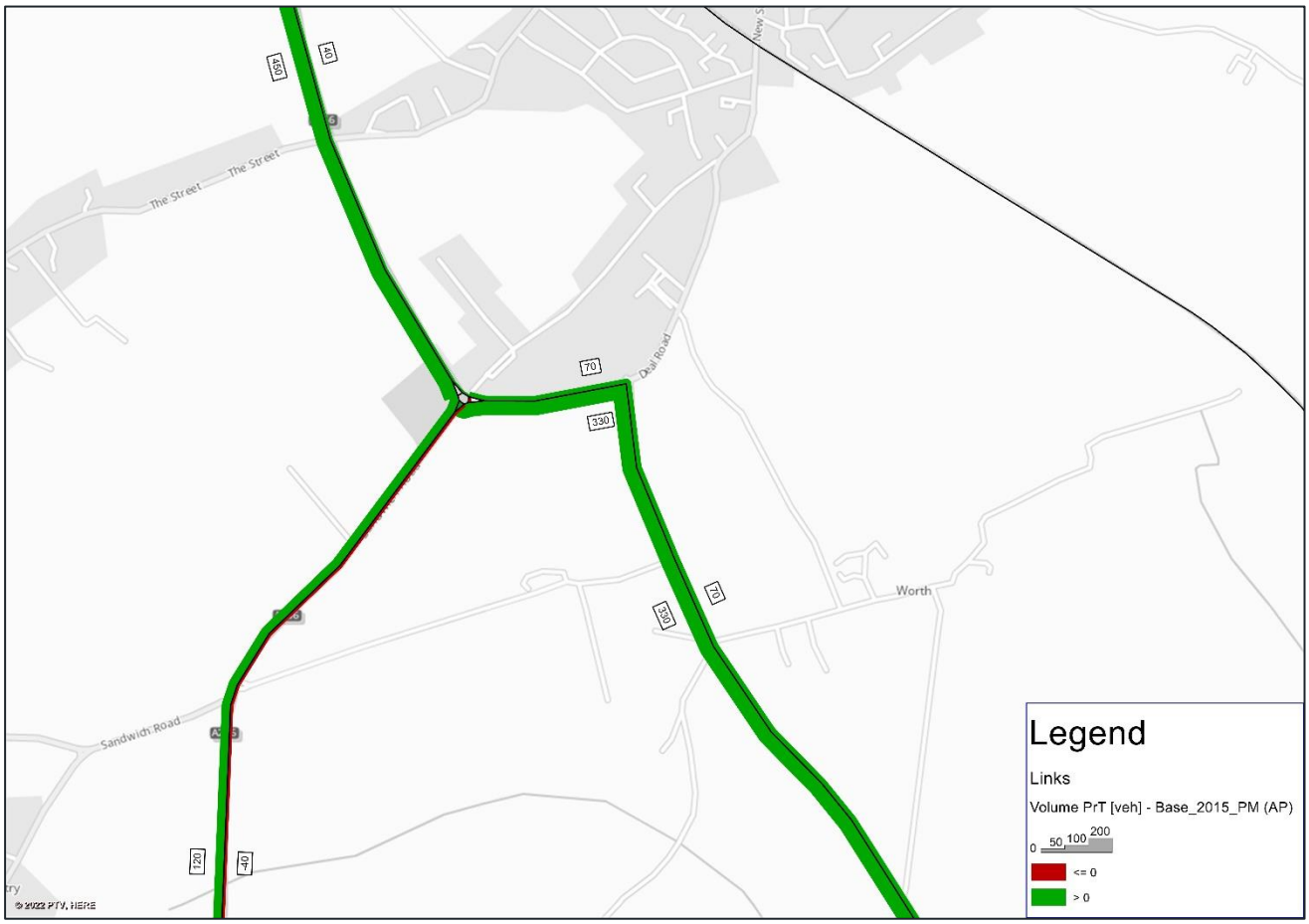


Figure 6-21: DDTM 2040 Do Minimum – Base Flow Difference, A256/ Deal Road Roundabout, PM Peak

6.3.25. Figure 6-22 shows the percentage flow change at the A256/ Deal Road roundabout in the PM Peak; the most significant growth in flows can be seen on the Deal Road approach with an increase of 70% of flows, which is approximately an annual growth of 2.8% across the 25-year growth period.

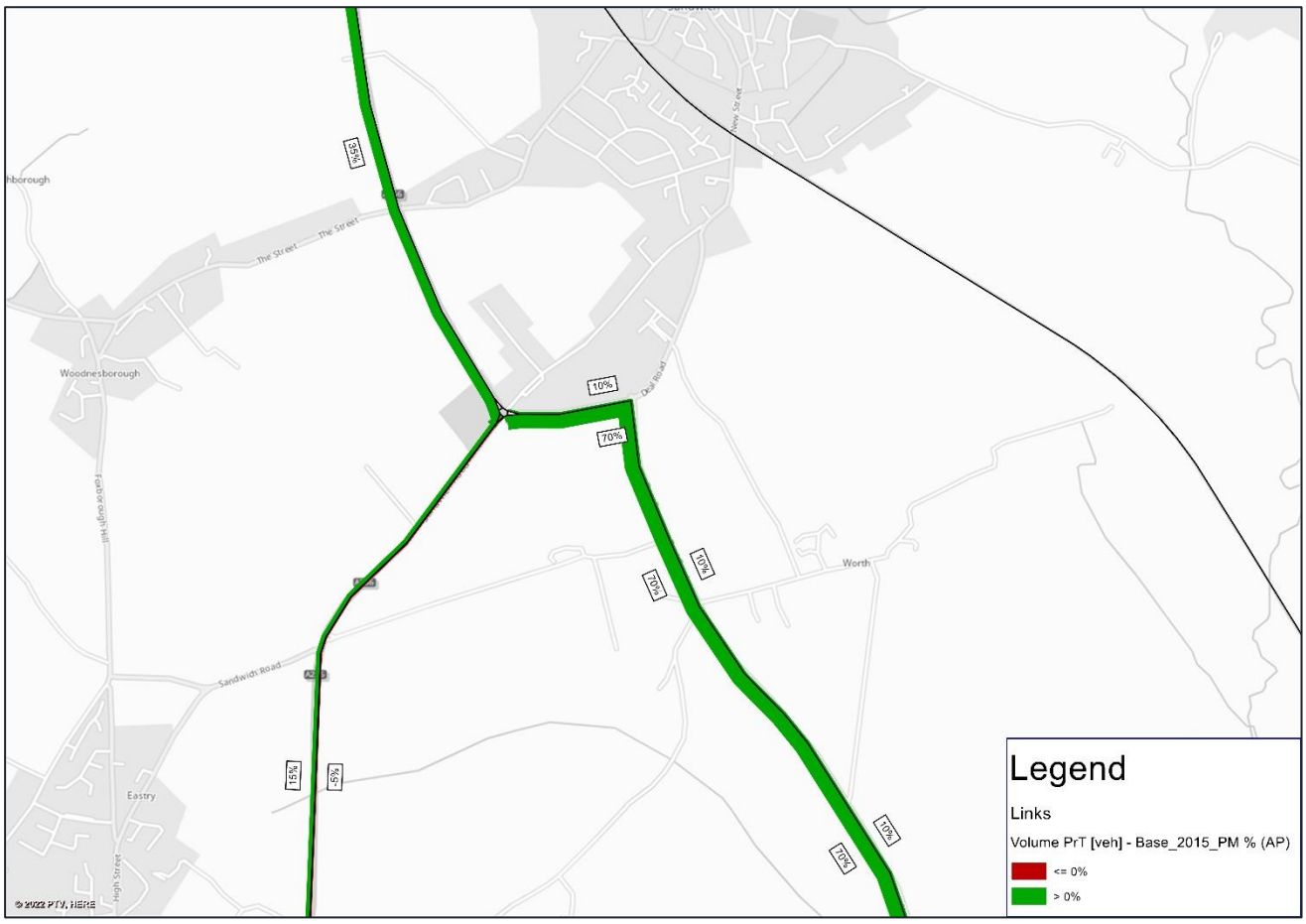


Figure 6-22: DDTM 2040 Do Minimum – Base % Flow Difference, A256/ Deal Road Roundabout, PM Peak

6.4 Do Minimum Volume over Capacity Assessment

6.4.1. A volume over capacity assessment has been undertaken to determine and classify the impact on links and nodes within the 2040 Do Minimum scenario, as a result of incorporating the completed and consented growth. The assessment is able to provide a high-level indication of possible junctions that are likely to experience capacity issues, or be approaching capacity constraints, prior to the inclusion of the potential Local Plan allocations.

6.4.2. The description of the threshold used to undertake the analysis are presented in Table 6-12.

Table 6-12: Volume over Capacity Assessment Criteria

Network Object	Volume over Capacity Thresholds	Impact Assessment
Links Worst Turn at Node	V/C < 85	Operating within capacity
	85 <= V/C < 100	Operating close to capacity
	V/C >= 100	Over capacity

6.4.3. Figure 6-23 and Figure 6-24 show the V/C impacts on links and nodes within the full extent of the DDTM 2040 Do Minimum model area in the AM and PM peak respectively; the impacts on a localised level with Dover and Deal are discussed later within this chapter.

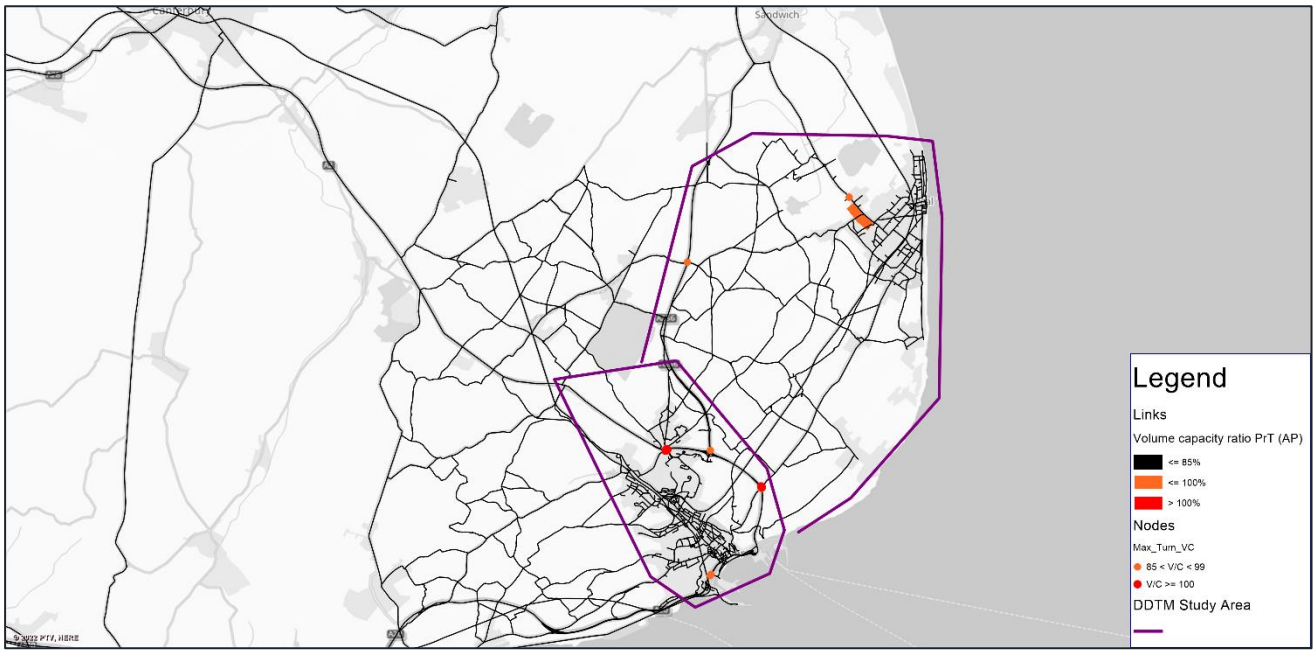


Figure 6-23: DDTM 2040 Do Minimum, V/C Assessment, Full Model Extent, AM Peak



Figure 6-24: DDTM 2040 Do Minimum, V/C Assessment, Full Model Extent, PM Peak

6.4.4. Figure 6-25 presents the V/C assessments on links and nodes within the Dover area in the AM peak categorised using the thresholds summarised in Table 6-12, with Figure 6-26 presenting a more detailed close-up of Whitfield roundabout, the A256/A2 grade-separated junction and the Duke of York roundabout.

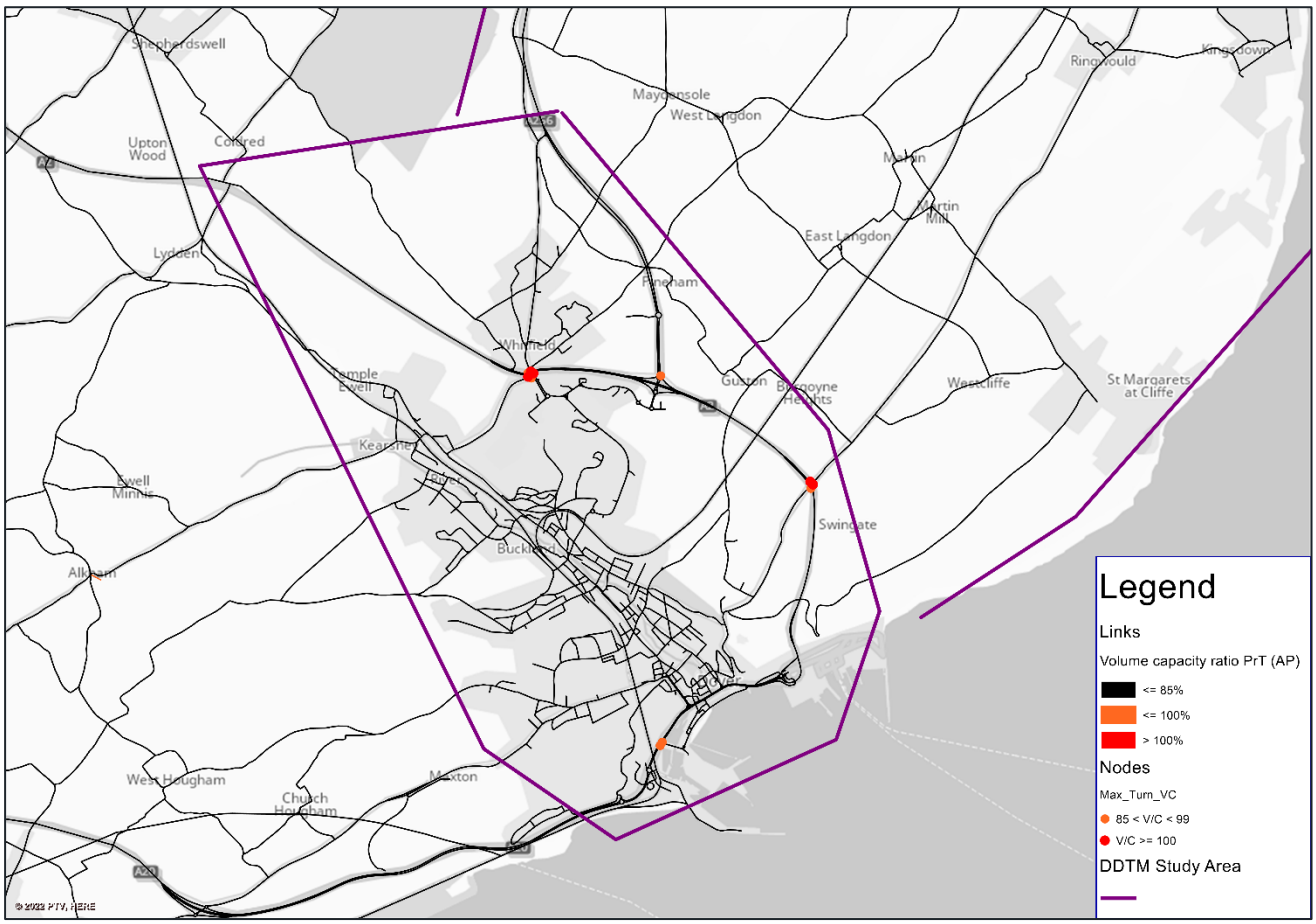


Figure 6-25: DDTM 2040 Do Minimum, V/C Assessment, Dover, AM Peak



Figure 6-26: DDTM 2040 Do Minimum, V/C Assessment, Dover Key Junctions, AM Peak

6.4.5. Figure 6-26 demonstrates that all approaches to Whitfield roundabout are operating close to (85-100%), or exceeding (100%+), capacity in the 2040 Do Minimum AM Peak. Similarly, all approaches to the Duke of York roundabout (except for the A258 northbound approach) are also operating above 85% V/C.

6.4.6. The A256 southbound approach to the A2/A256 junction is currently operating close to capacity (85%), and at a level that increased demand included within the Do Something Local Plan scenario would result in this junction deteriorating more.

6.4.7. For the PM Peak, Figure 6-27 presents the V/C assessments on links and nodes within the Dover area and Figure 6-28 presents a more detailed close-up of Whitfield roundabout, the A256/A2 grade-separated junction and the Duke of York roundabout.

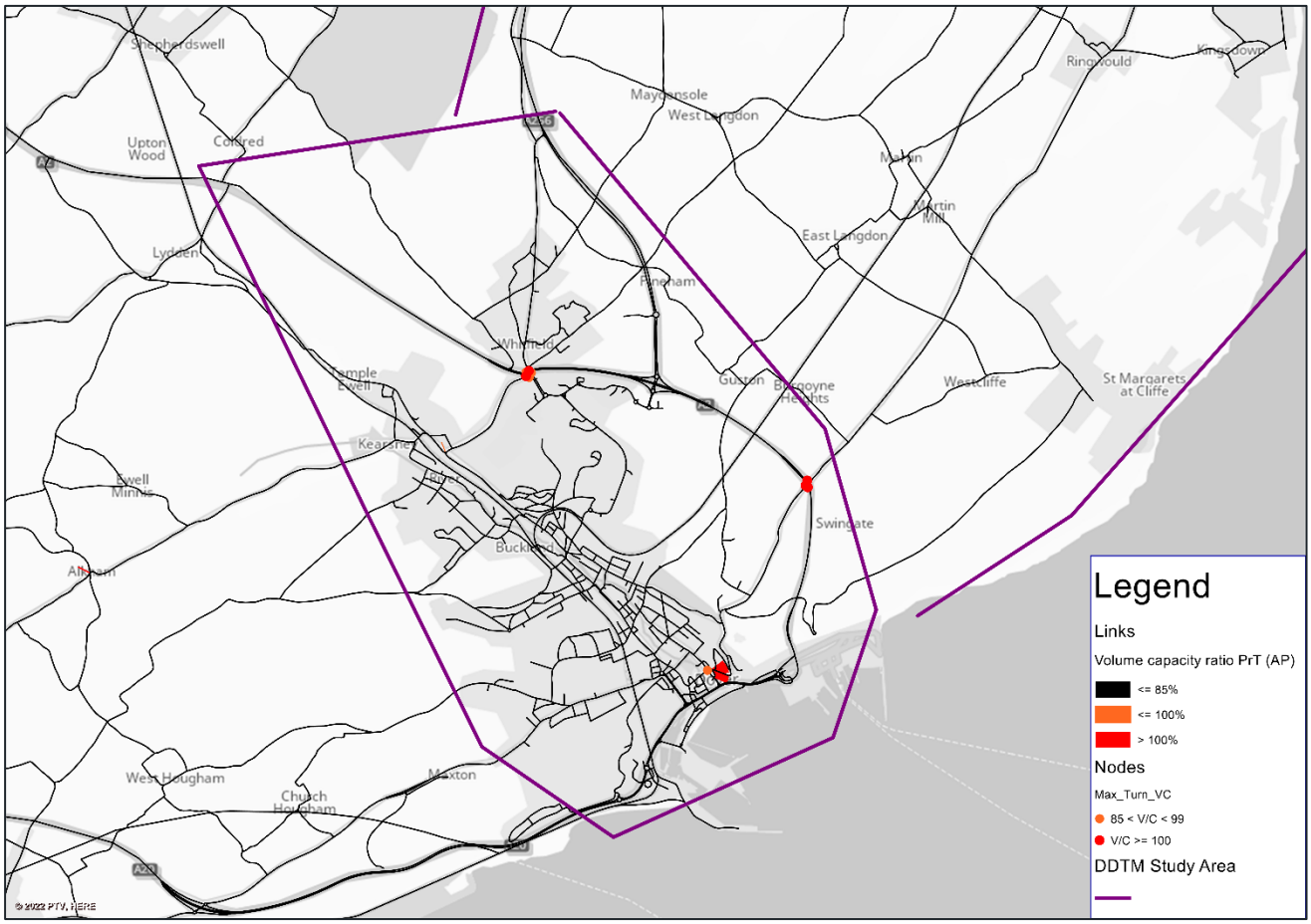


Figure 6-27: DDTM 2040 Do Minimum, V/C Assessment, Dover, PM Peak

6.4.8. Generally, the PM peak presents broadly consistent patterns with the AM Peak; the tidal nature of AM vs PM flows within Dover means that the A258 Deal Road southbound approach to Duke of York roundabout is operating below 85% V/C. It is noted, in all circumstances, WSP have presented V/C representative of the worst turn at each node and therefore it is possible that some turning movements operate within capacity.

6.4.9. Figure 6-28 demonstrates that the Duke of York has a turn V/C exceeding 85% at 3 out of 4 approaches in the PM peak, with only the Deal Road southbound approach operating well within capacity.

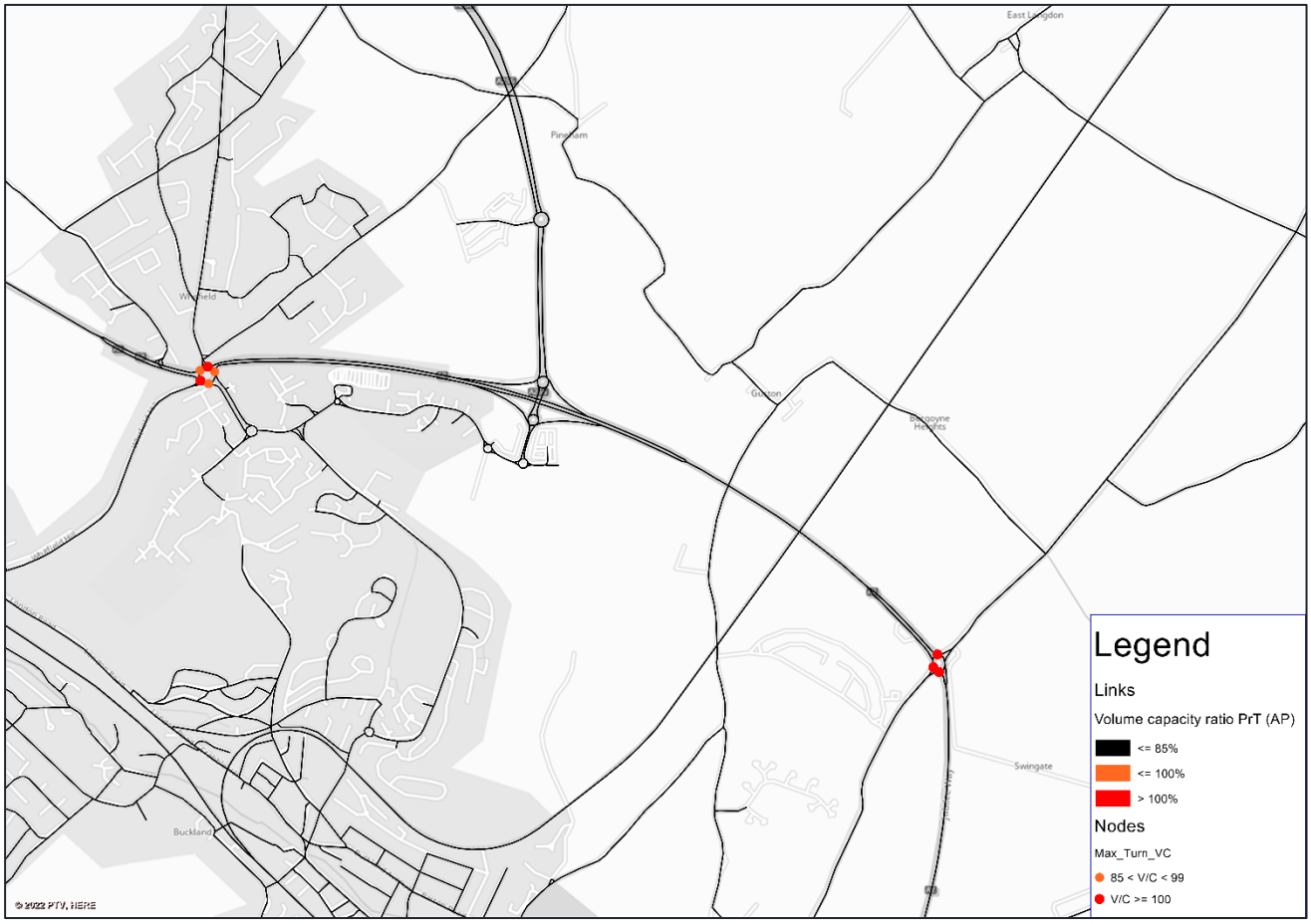


Figure 6-28: DDTM 2040 Do Minimum, V/C Assessment, Dover Key Junctions, PM Peak

6.4.10. V/C analysis within Dover for the AM and PM peak hours within the 2040 Do Minimum scenario has demonstrated that the Whitfield and Duke of York roundabouts are forecast to operate close to or over capacity on most approaches. A V/C of over 100%, whereby the vehicle demand exceeds the capacity of the turning movement at the roundabout approaches, will likely detract vehicles away from these junctions and any additional demand will further exacerbate these observations.

6.4.11. Figure 6-29 presents the V/C assessments on links and nodes within Deal in the AM peak.

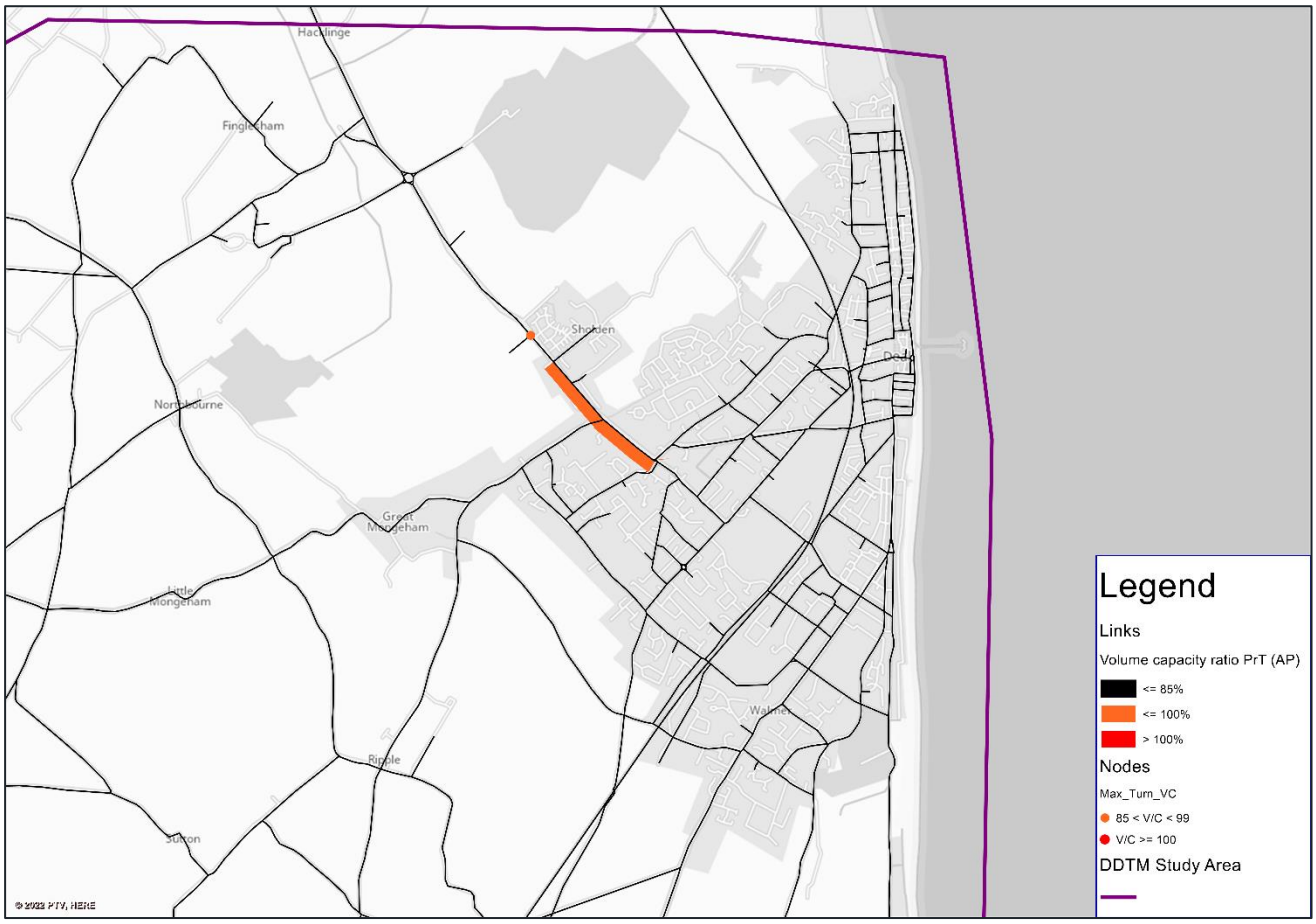


Figure 6-29: DDTM 2040 Do Minimum, V/C Assessment, Deal, AM Peak

6.4.12. The V/C assessment within Deal demonstrates less significant capacity constraints when compared with Dover however a link V/C over 85% is evident northbound on the A258 away from the London Road / Manor Road junction. The junction where the Sholden development joins the network is nearing capacity with a V/C value of 86%, however as this is near a zone connector the constraints may be overinflated.

6.4.13. Figure 6-30 presents the V/C assessments on links and nodes within Deal in the PM Peak; it shows that the majority of links and nodes within Deal operate with a V/C less than 85%, with the exception of a short section of circulatory at the London Road / Manor Road roundabout which operates at 86%.

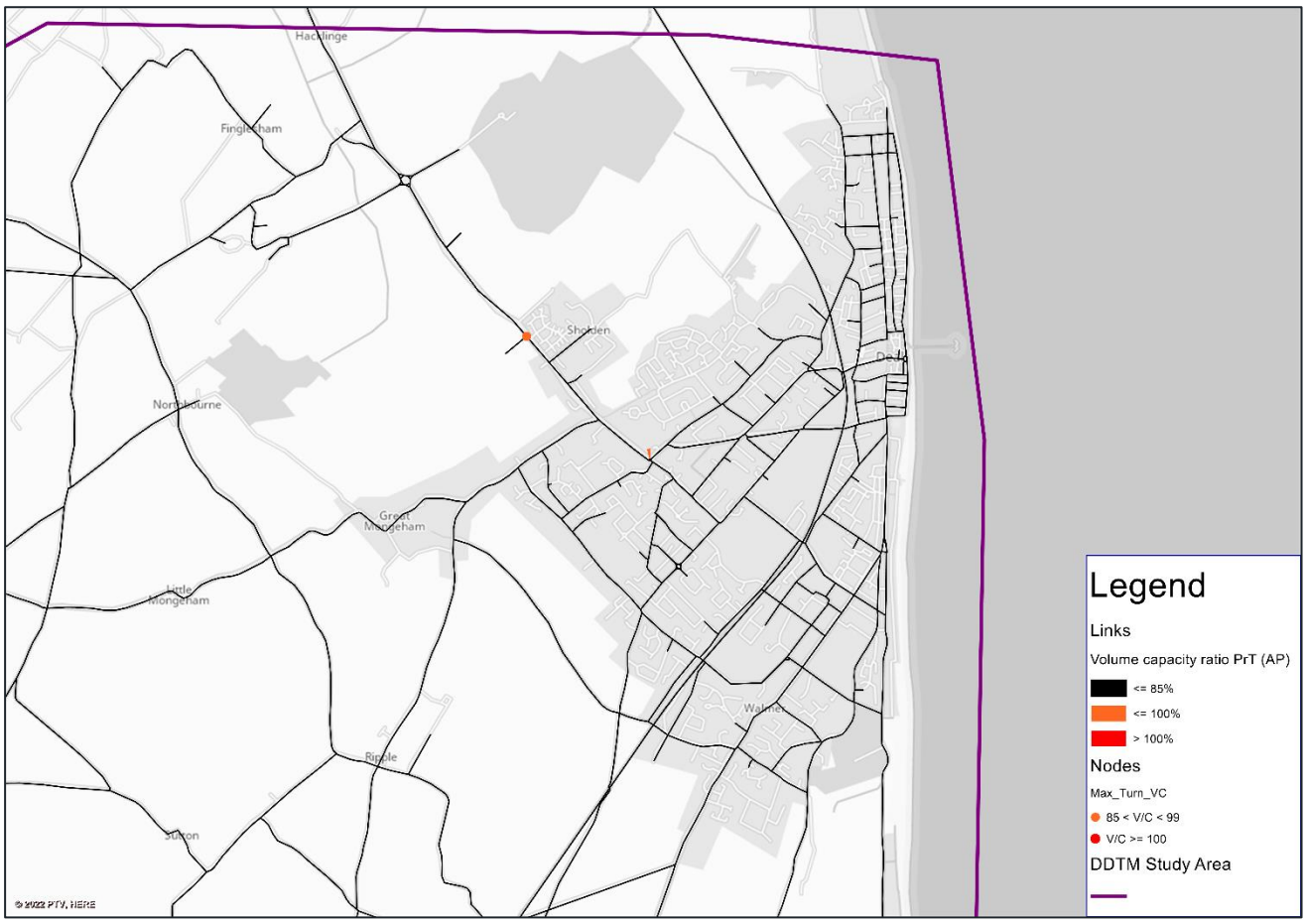


Figure 6-30: DDTM 2040 Do Minimum, V/C Assessment, Deal, PM Peak

6.4.14. The V/C assessment has been undertaken on the 2040 Do Minimum scenario to determine which links and junctions are at risk of being over capacity prior to the additional demand generated by the potential Local Plan allocations, included within the Do Something scenarios. The assessment has demonstrated that Whitfield roundabout and Duke of York roundabout are forecast to operate close to, or over capacity, on all approaches in both the AM and PM peak. Additional demand at these junctions exceeds the turning capacity and as such significant re-routing is likely to occur as the attractiveness of more minor routes, without delays, increases. Undertaking this assessment for the Do Something vs Do Minimum will be useful in determining which links and junctions have additional adverse impact as a direct result of the potential Local Plan allocations and where mitigation might therefore be required.

6.4.15. Table 6-13 summarises the links and nodes with V/C exceeding 85% in either 2040 Do Minimum AM or/and PM peak models. If there is an exceedance of 85% the text is coloured

orange, if the performance is over 100% the text is coloured red. This summary is expanded to compare against the Do Something performance at these links and nodes later within this chapter.

Table 6-13: V/C Links and Nodes Summary, Do Minimum Scenario, AM and PM Peak

	Network Location within DDTM Study Area	AM Peak V/C	PM Peak V/C
Link	A256 Whitfield Hill / London Road roundabout	77	88
	A258 London Road, Northbound	95	61
	A258 London Rd / Manor Rd roundabout Circulatory Arm	108	72
	Castle Hill Road / St James Street SB	75	114
Node	Whitfield Roundabout, A2 West Approach	94	98
	Whitfield Roundabout, Whitfield Hill Approach	99	100
	Whitfield Roundabout, Sandwich Road North Approach	103	103
	Whitfield Roundabout, A2 East Approach	100	87
	Whitfield Roundabout, Honeywood Road Approach	85	89
	Duke of York roundabout – A2 West Approach	105	101
	Duke of York roundabout – A2 Jubilee Way Approach	90	99
	Duke of York roundabout – A258 Deal Road North Approach	105	68
	Duke of York roundabout – A258 Deal Road South Approach	84	105
	A256 / A2 Northern Roundabout, Southbound Approach	85	50
	A20 Limekiln Street/ Union Street Signalised junction	88	74
	Castle Street/ Maison Dieu Road Signalised junction	82	95
	Dover Road/ Boys Hill Roundabout, A256 North Approach	95	62

6.4.16. Whilst the strategic model offers a useful indicator of junctions, or roads, which are impacted within the Do Minimum model, it is recommended that the junctions are assessed in detail within a localised calibrated junction model to determine the specific V/C constraints in 2040 and potential mitigation measures to be adopted to resolve the issues.

6.5 Do Something 1 No Mitigation vs DM

6.5.1. The Duke of York and Whitfield junction mitigations were agreed and accepted with NH and KCC in May 2022. The results of DS1 and DS2 with no mitigation are included in this report to provide an overview of how the network performs without the junction improvements.

6.5.2. Changes between the DS No Mitigation and DM difference plots have been created to understand the change in actual flows as a result of the allocations and provisional infrastructure along the network. Some large increases are accredited to instances whereby new transport infrastructure has been coded into the Do Something scenario and as such all flow on a new link is therefore an increase; examples of this are along the A2 and A256 where new junctions have been added. Figure 6-31 demonstrates in red the links where this is occurring in subsequent figures.

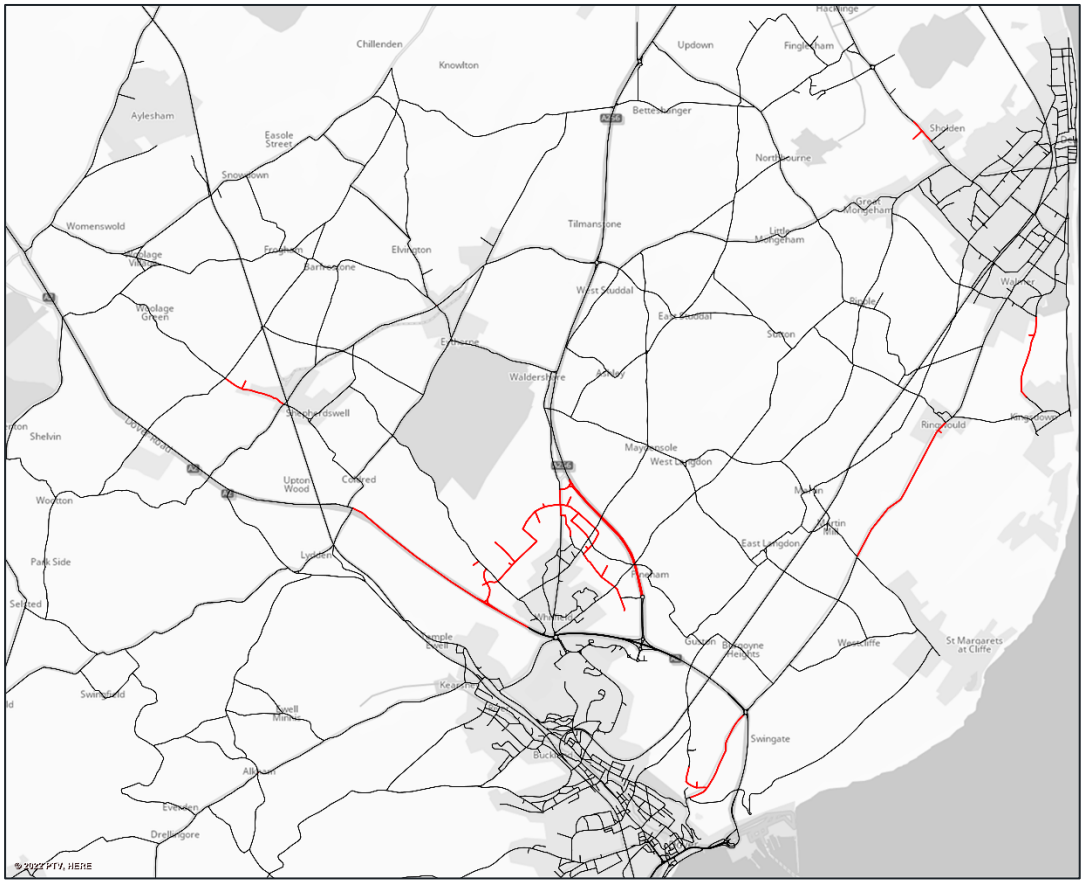


Figure 6-31: DDTM 2040 Do Something New Links

6.5.3. Figure 6-32 presents the actual flow difference between the 2040 DS1 No Mitigation and 2040 DM in Dover in the AM Peak. It is noted that these figures do not include labels and have instead been presented to show the broad patterns in flow increase / decrease and on which roads these occur.

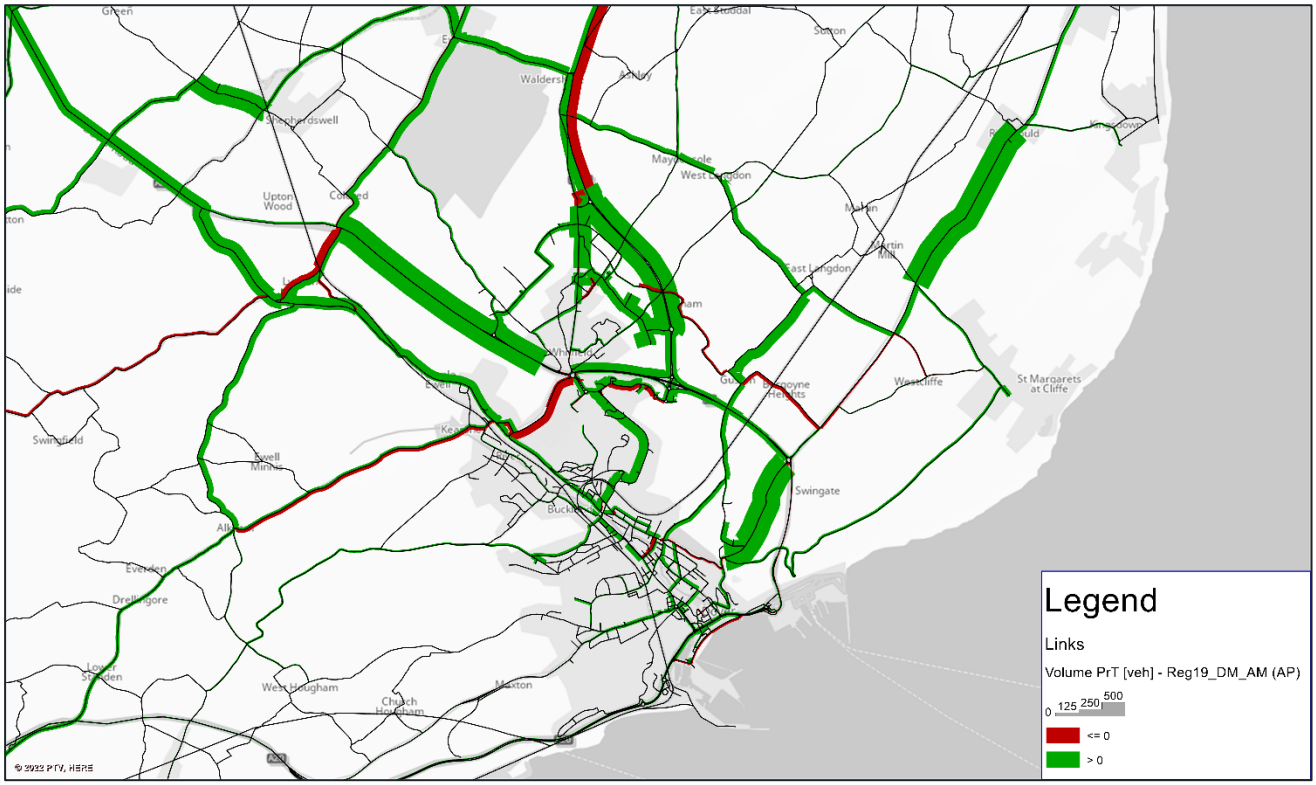


Figure 6-32: DDTM 2040 Do Something 1 No Mitigation – Do Minimum Flow Difference, Dover, AM Peak

6.5.4. The additional local plan growth in the DS1 No Mitigation AM results show increased rat-running traffic westbound through East Langdon with similar levels of decreases seen on Hangmans Lane. The reductions on Hangmans Lane are due to the queues extending further north on the A258 in the DS1 No Mitigation compared with the DM, resulting in rat running traffic leaving the strategic road network onto rural routes sooner.

6.5.5. There are some flow increases travelling south on Coldred Road and East on Kennel Hill from areas such as Elvington and Eythorne, this is due to the increases in Local Plan development in this locality.

6.5.6. There are reductions in traffic flow on Whitfield Hill southbound with increases of similar magnitude travelling through Lydden on Canterbury Road, during the DS scenario, traffic is routing away from the Whitfield roundabout and onto rural routes to travel into Dover town centre.

6.5.7. White Cliffs Business Park is a significant trip attractor in the AM Peak, due to the large provision of jobs at this site, and some vehicles access via the A2 / A256 grade separated junction.

6.5.8. Figure 6-33 presents the actual flow difference between the 2040 Do Something 1 No Mitigation and 2040 Do Minimum in Dover in the PM Peak. Similar to the AM Peak, that these figures do not include labels and have instead been presented to show the broad patterns in flow increase / decrease and on which roads these occur.

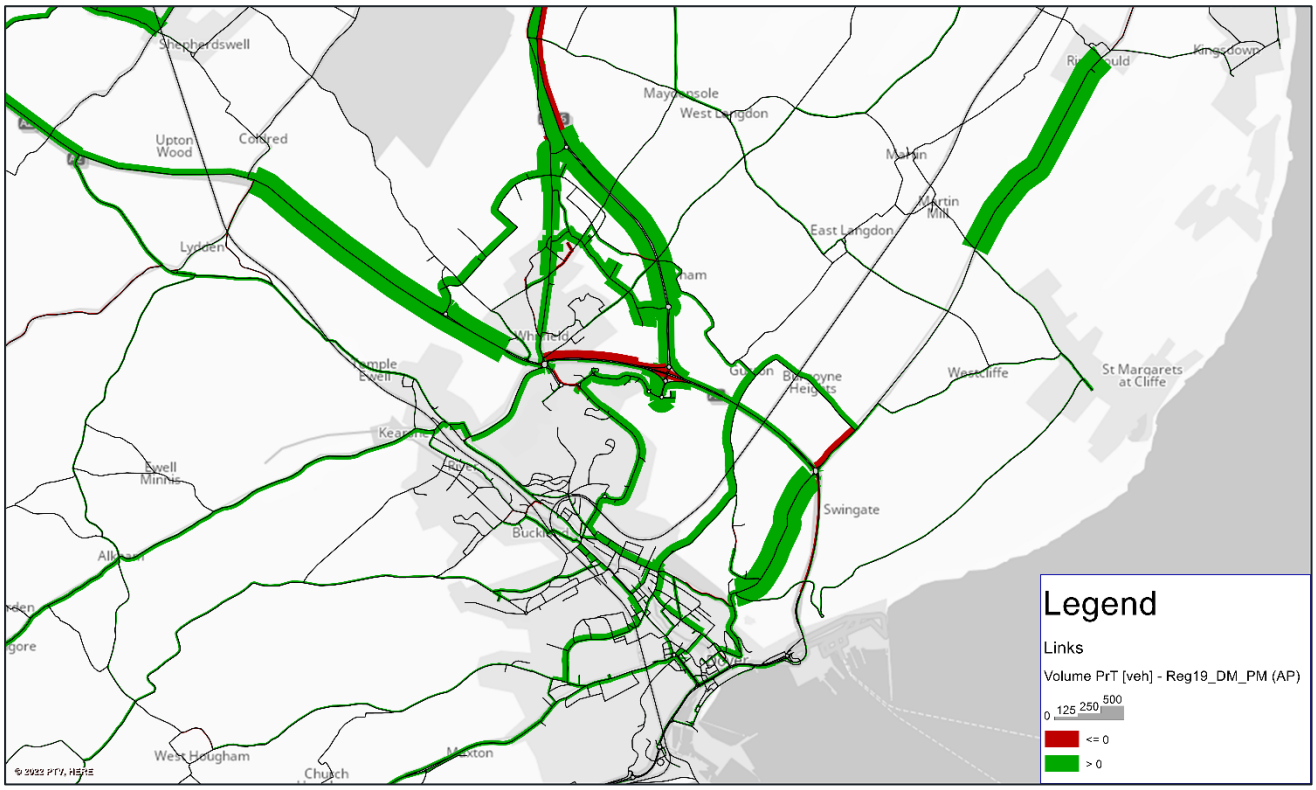


Figure 6-33: DDTM 2040 Do Something 1 No Mitigation – Do Minimum Flow Difference, Dover, PM Peak

6.5.9. There are increases in flow across the network with exceptions of A2 westbound between Whitfield roundabout and the A2/A256 interchange, A2 Jubilee Way, A258 northbound near Guston and A256 southbound to the north of the Whitfield development roundabout. Reductions on the A258 northbound is due to the rat-running traffic accessing the A258 northbound via Hangmans Lane to avoid the Duke of York roundabout that is oversaturated in the DM. Similar trends are evident on the A2 Jubilee Way northbound where reduction in flow are around 50 vehicles as a result of increased congestion with vehicles using A258 and Upper Road instead. These trends tend to be the reverse to those in the AM peak due to the tidal pattern of employment trips.

6.5.10. A reduction in vehicles is shown eastbound along the A2, between Whitfield roundabout and the A256 / A2 grade-separated junction. In part, this is accredited to re-routing along Dover Road and The Lane; additionally, a proportion of trips that previously accessed the A2

eastbound at Whitfield roundabout via Honeywood Parkway, now travel along Honeywood Parkway and use the A2/A256 junction.

6.5.11. Figure 6-34 and Figure 6-35 present the actual flow difference between the 2040 Do Something and the 2040 Do Minimum in Deal in the AM Peak and PM Peak respectively. Generally, the Deal area shows less significant increases and decreases in vehicle volumes, compared with Dover, as a result of including the potential Local Plan development allocations.

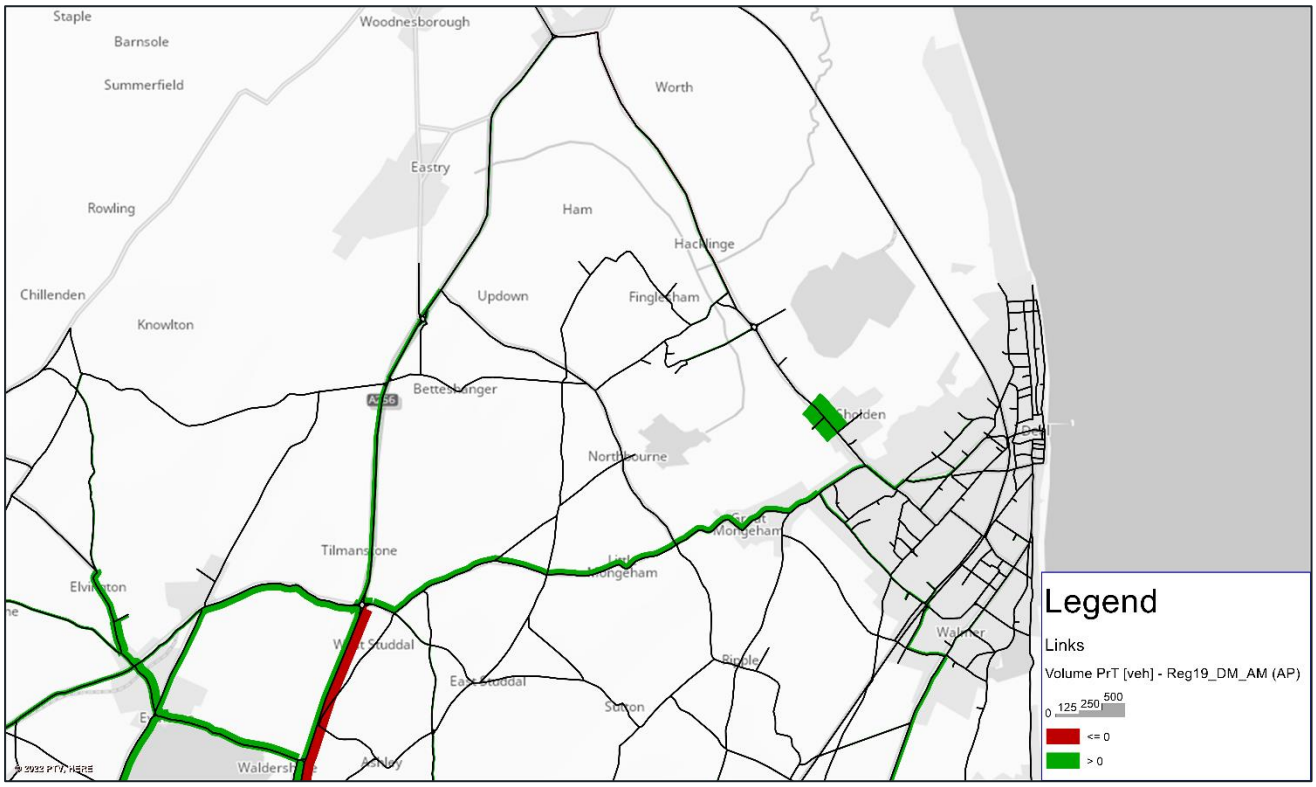


Figure 6-34: DDTM 2040 Do Something 1 No Mitigation - 2040 Do Minimum, Deal, AM Peak

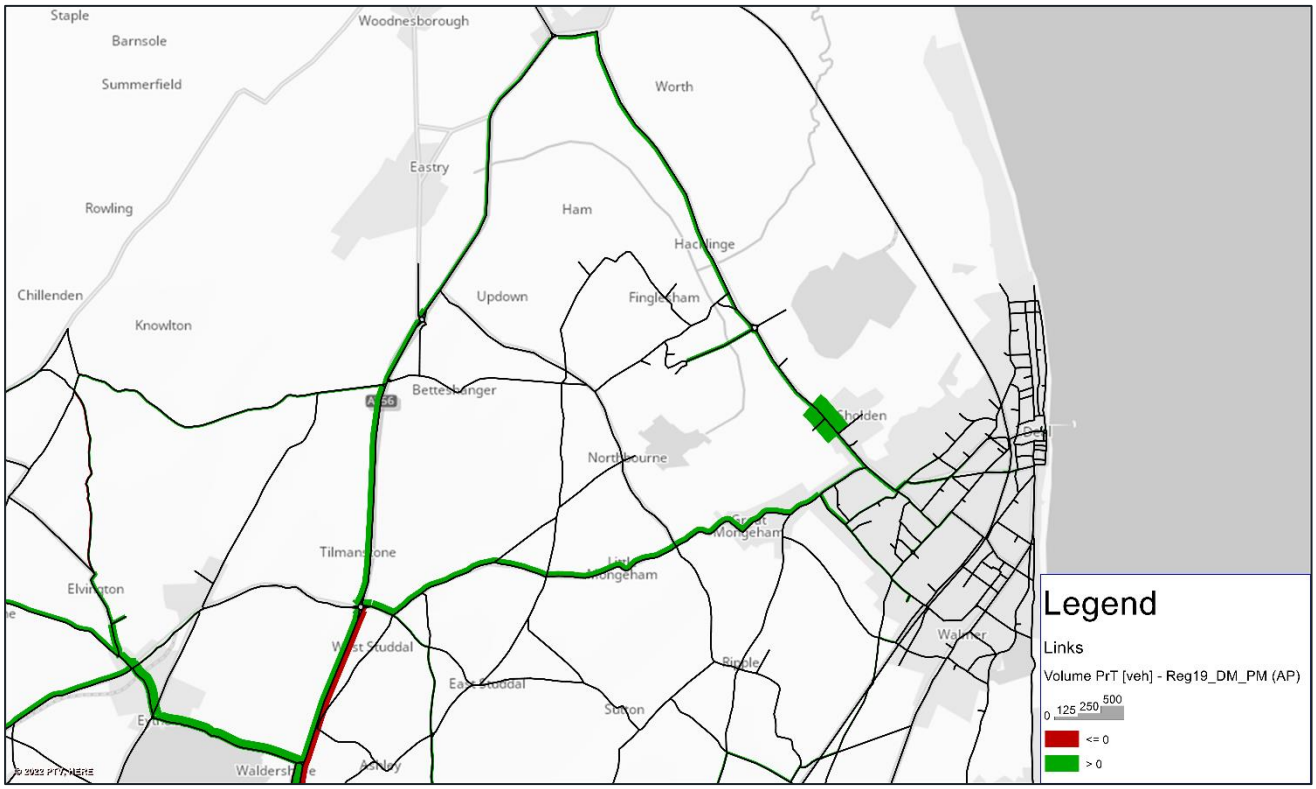


Figure 6-35: DDTM 2040 Do Something 1 No Mitigation - 2040 Do Minimum, Deal, PM Peak

6.5.12. As with the Do Minimum vs Base assessment, junctions of interest were assessed using the actual flow and percentage flow difference as a point of comparison to demonstrate the arms with increases and decreases. This allowed the impacts of the Dover Local Plan sites modelled in 2040 Do Something scenario to be compared against the 2040 Do Minimum scenario without any junction mitigations assumed.

6.5.13. Figure 6-36 presents the actual flow change at Whitfield Roundabout in the AM peak; there are reductions of flows on Sandwich Road, A2 eastbound and Whitfield Road approaches of between 20 and 70 flows. This is a result of increased congestion at Whitfield roundabout with traffic rerouting away from the roundabout. For example, there is a reduction in traffic travelling southbound along Sandwich Road, Whitfield Hill and Alkham Valley and they are travelling via Coldred Hill and Warren Lane instead to get to areas to the west of Dover such as West Hougham. The largest increases of approach flow are on Honeywood Road of 140 vehicles with a large proportion of these flows are due to the development at White Cliffs Business Park.

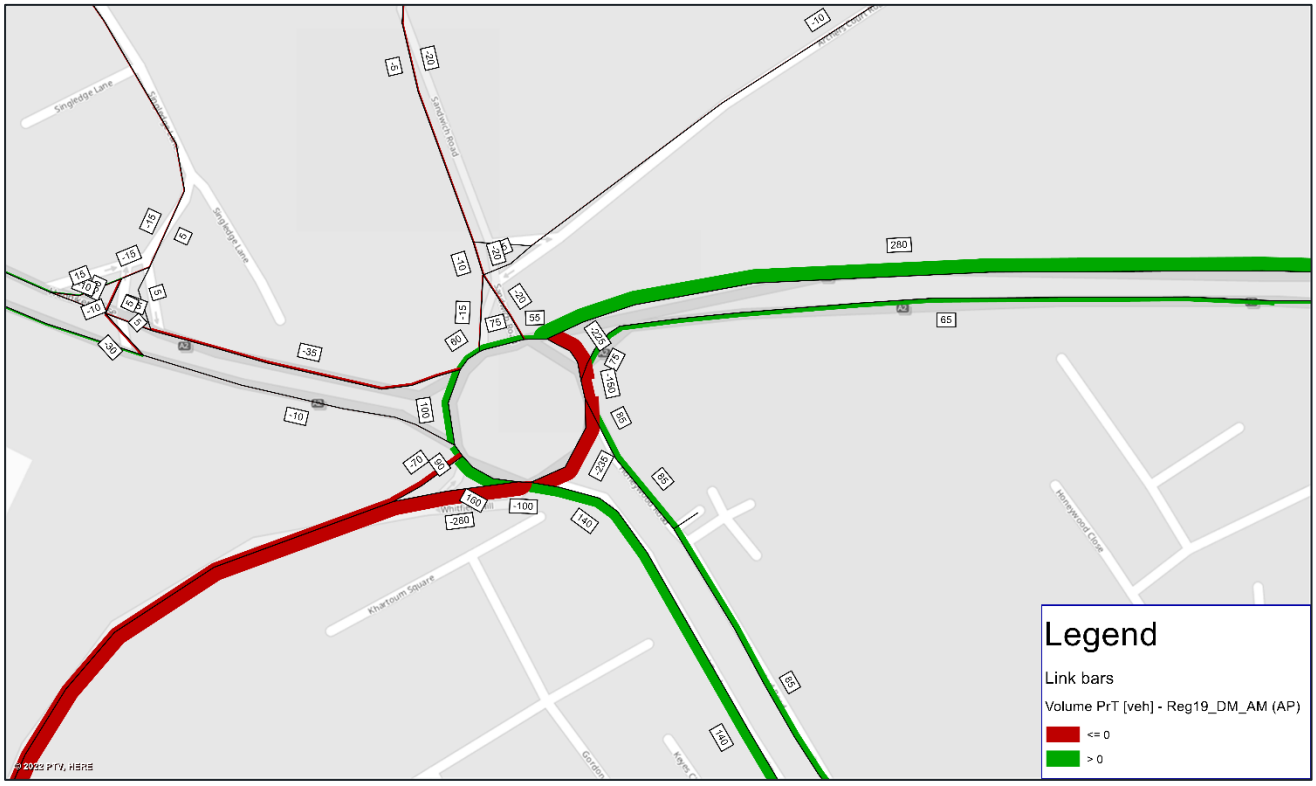


Figure 6-36: DDTM 2040 Do Something 1 No Mitigation - 2040 Do Minimum Flow Difference, Whitfield Roundabout, AM Peak

6.5.14. Figure 6-37 shows the percentage flow changes at the Whitfield roundabout in the AM peak; flows on the Sandwich Road, Whitfield Hill and A2 coastbound approach decrease by up to 5%. There are increases on the A2 eastern arm and Honeywood Road of 5% and 15% respectively - given the growth period of 25 years, this is approximately 0.2% and 0.6% increase per annum.

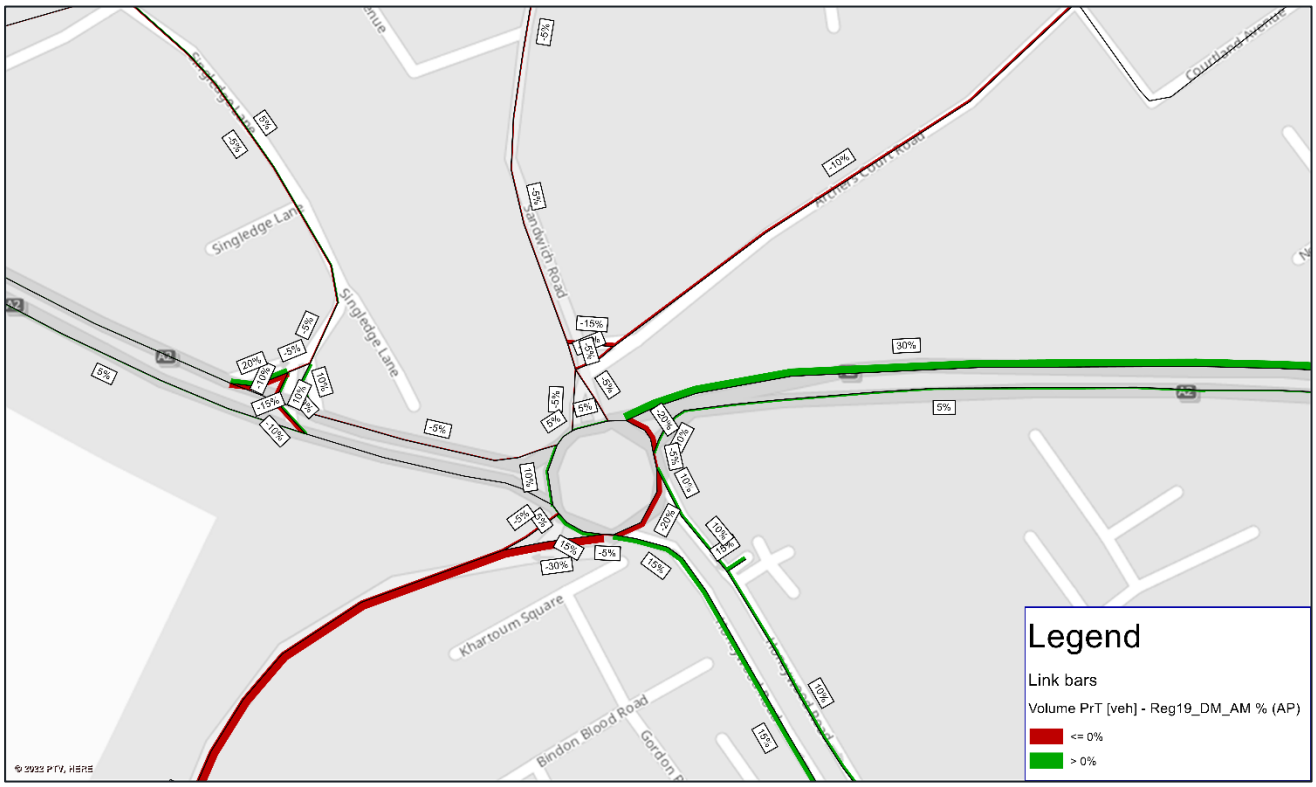


Figure 6-37: DDTM 2040 Do Something 1 No Mitigation - 2040 Do Minimum % Difference, Whitfield Roundabout, AM Peak

6.5.15. Figure 6-38 illustrates the actual flow changes at the Whitfield Roundabout in the PM Peak; flows along the A2 Westbound increase by approximately 105 vehicles. There are decreases of 295 vehicles using the A2 Eastbound with similar levels of increases observed on the A256 interchange, this suggests that traffic is routing away from the Whitfield roundabout as it becomes more saturated.

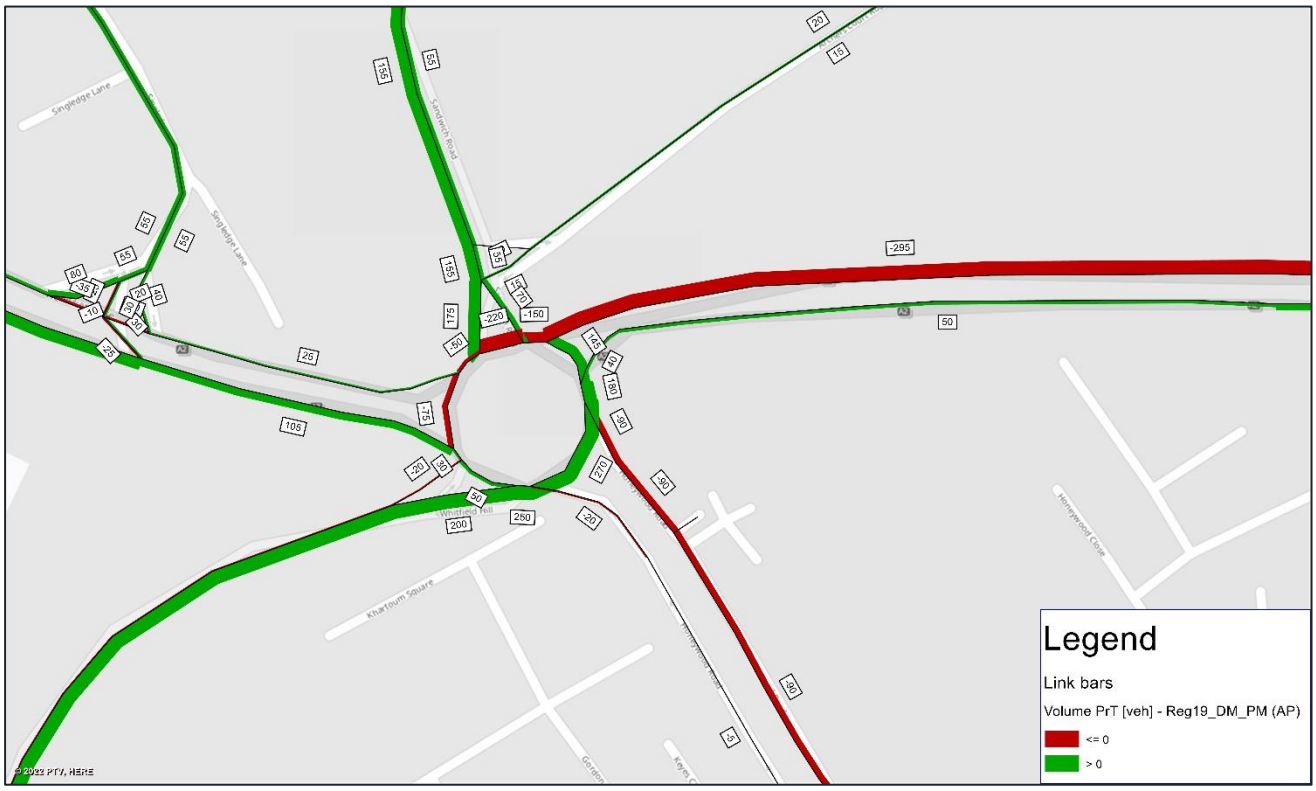


Figure 6-38: DDTM 2040 Do Something 1 No Mitigation - 2040 Do Minimum Flow Difference, Whitfield Roundabout, PM Peak

6.5.16. Figure 6-39 presents the percentage flow difference at the Whitfield roundabout in the PM peak and demonstrates an average increase of approximately 40% travelling northbound on Sandwich Road. There is a reduction of flows on the A2 eastbound of 20% east of the junction.

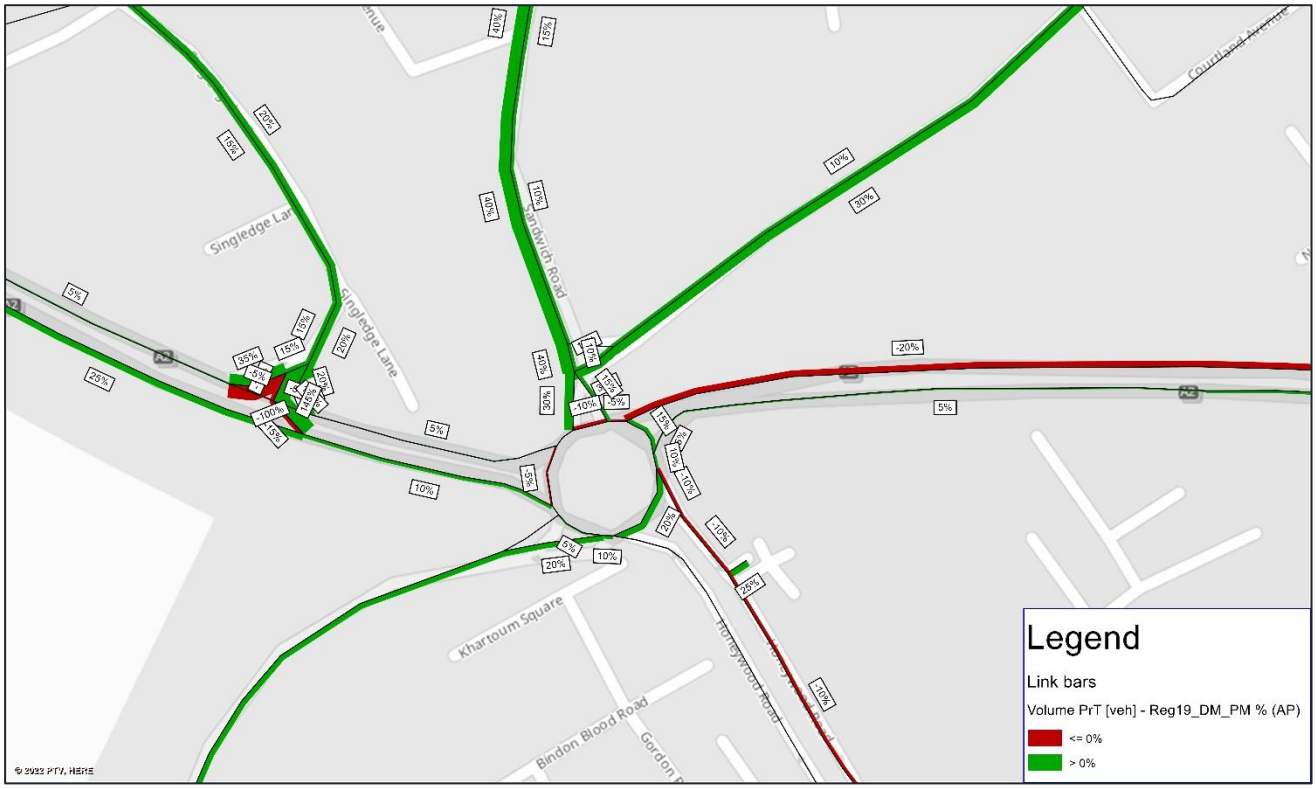


Figure 6-39: DDTM 2040 Do Something 1 No Mitigation - 2040 Do Minimum % Difference, Whitfield Roundabout, PM Peak

6.5.17. Figure 6-40 presents the actual flow increases at the Duke of York roundabout in the AM Peak. It is noted that flow differences have not been presented for the A258 south of the roundabout as this link does not have consistent numbering between DM and DS scenarios. This is a result of inconsistent model coding in this area between DM and DS scenarios.

6.5.18. Increases in vehicle volumes westbound along the A2 are accredited to employment trips wishing to access White Cliffs Business Park at the A256/A2 junction to the west and the residential trips leaving the nearby Connaught Barracks site. There are reductions of 80 southbound vehicles on the A258 in this scenario, this is due to the trips previously rat running through Guston via Hangmans Lane using Pond Lane in the DS due to increased queues on the A258.

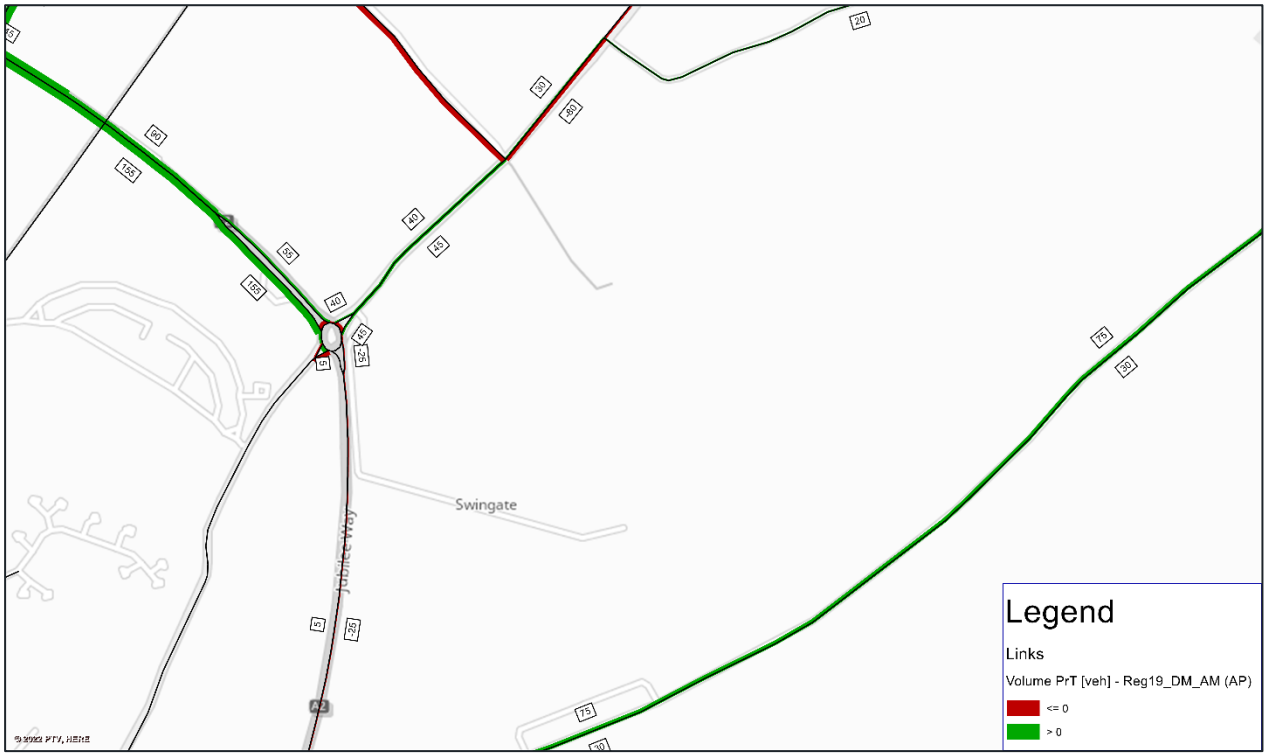


Figure 6-40: DDTM 2040 Do Something 1 No Mitigation - 2040 Do Minimum Actual Difference, DoY Roundabout, AM Peak

6.5.19. Figure 6-41 shows the percentage flow change at the Duke of York Roundabout in the AM peak; there are minimal changes in traffic flow on all approaches. The small changes are due to the junction performing over capacity in the DM and as such any additional traffic as a result of the Local Plan growth will likely route away from the junction.

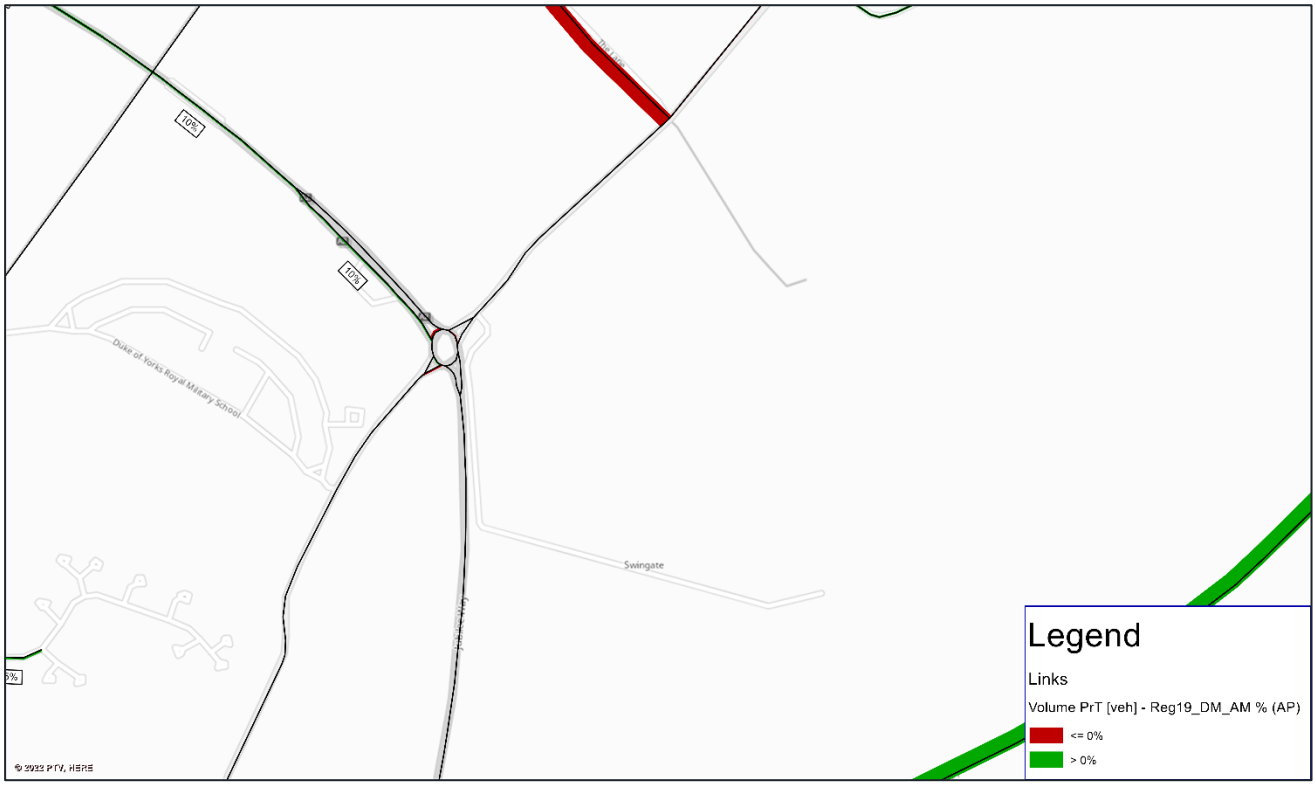


Figure 6-41: DDTM 2040 Do Something 1 No Mitigation - 2040 Do Minimum % Difference, DoY Roundabout, AM Peak

6.5.20. Figure 6-42 presents the actual flow differences at the Duke of York roundabout in the PM peak; this highlights an increase of flows of 75 and 65 on the A2 coastbound and A258 southbound. Larger decreases of flow are seen on the A258 northbound of 210, this is due to the rat-running through Guston as mentioned in paragraph 6.6.15 and assessed further in the Duke of York trigger point assessment (Appendix N,in separate document).



Figure 6-42: DDTM 2040 Do Something 1 No Mitigation - 2040 Do Minimum Actual Difference, DoY Roundabout, PM Peak

6.6 Do Something 2 No Mitigation vs DM

6.6.1. To understand the impact of the Local Plan allocations in the DS2 with an additional 2,930 WUE dwellings flow difference and percentage difference plots have been produced between the DS2 and DM without Whitfield and Duke of York junction improvements.

6.6.2. Figure 6-43 presents the actual flow difference between the 2040 Do Something 2 No Mitigation and 2040 Do Minimum in Dover in the AM Peak. As with the DS1 No Mitigation these figures do not include labels and have instead been presented to show the broad patterns in flow increase / decrease and on which roads these occur. Some large increases are accredited to instances whereby new transport infrastructure has been coded Figure 6-31 demonstrates in red the links where this is occurring in subsequent figures.

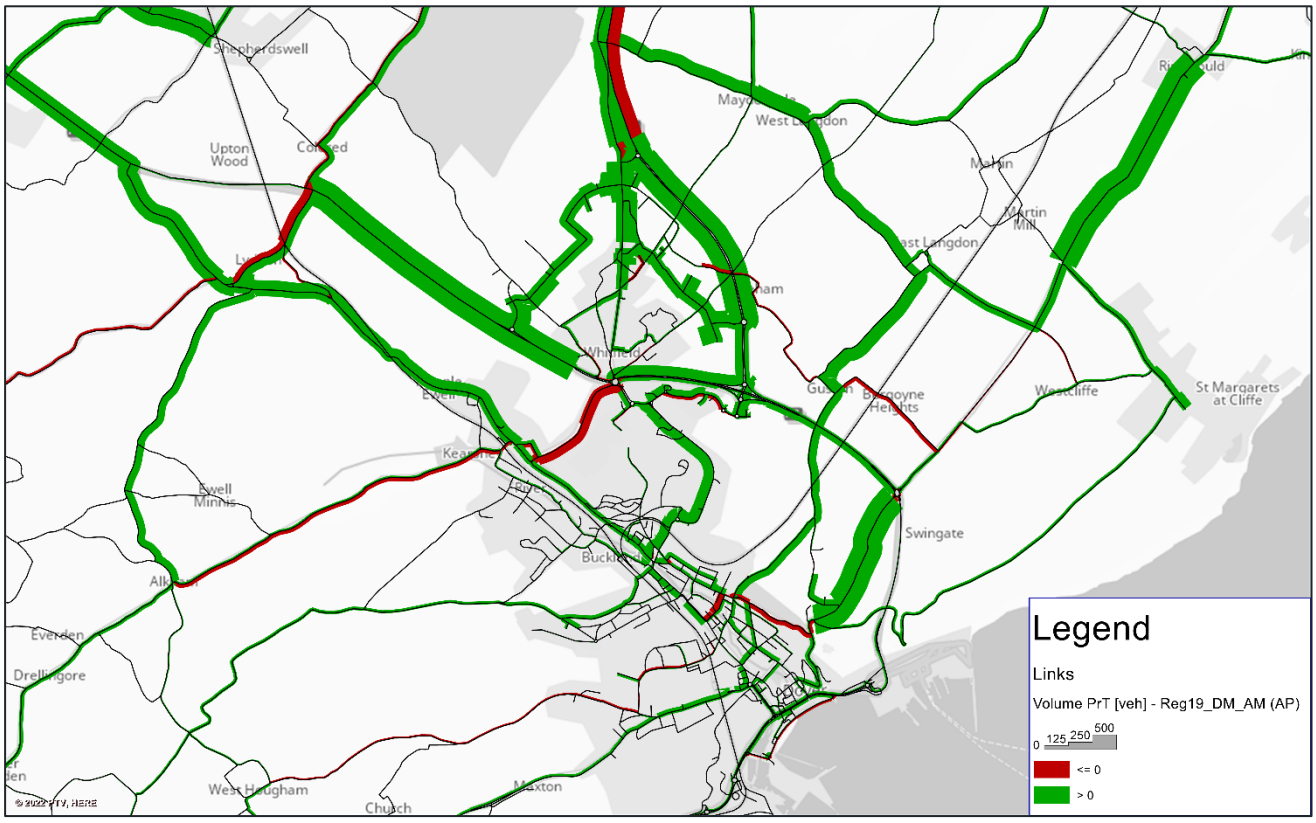


Figure 6-43: DDTM 2040 Do Something 2 No Mitigation – Do Minimum Flow Difference, Dover, AM Peak

6.6.3. Detailed investigation into the AM flow differences presented in Figure 6-43, show similar patterns to the DS1 No Mitigation (Figure 6-34). Increased flow is seen to travel southbound through Guston via Waldershare Lane and Pond Lane to access Dover town centre. There are decreases of flow northbound on Coldred Hill with broadly similar increases on Lydden Hill northbound, the DS traffic access the A2 westbound via Lydden Hill rather than Coldred Hill in the DM.

6.6.4. Figure 6-44 presents the actual flow difference between the 2040 DS2 No Mitigation and 2040 Do Minimum in Dover in the PM Peak.

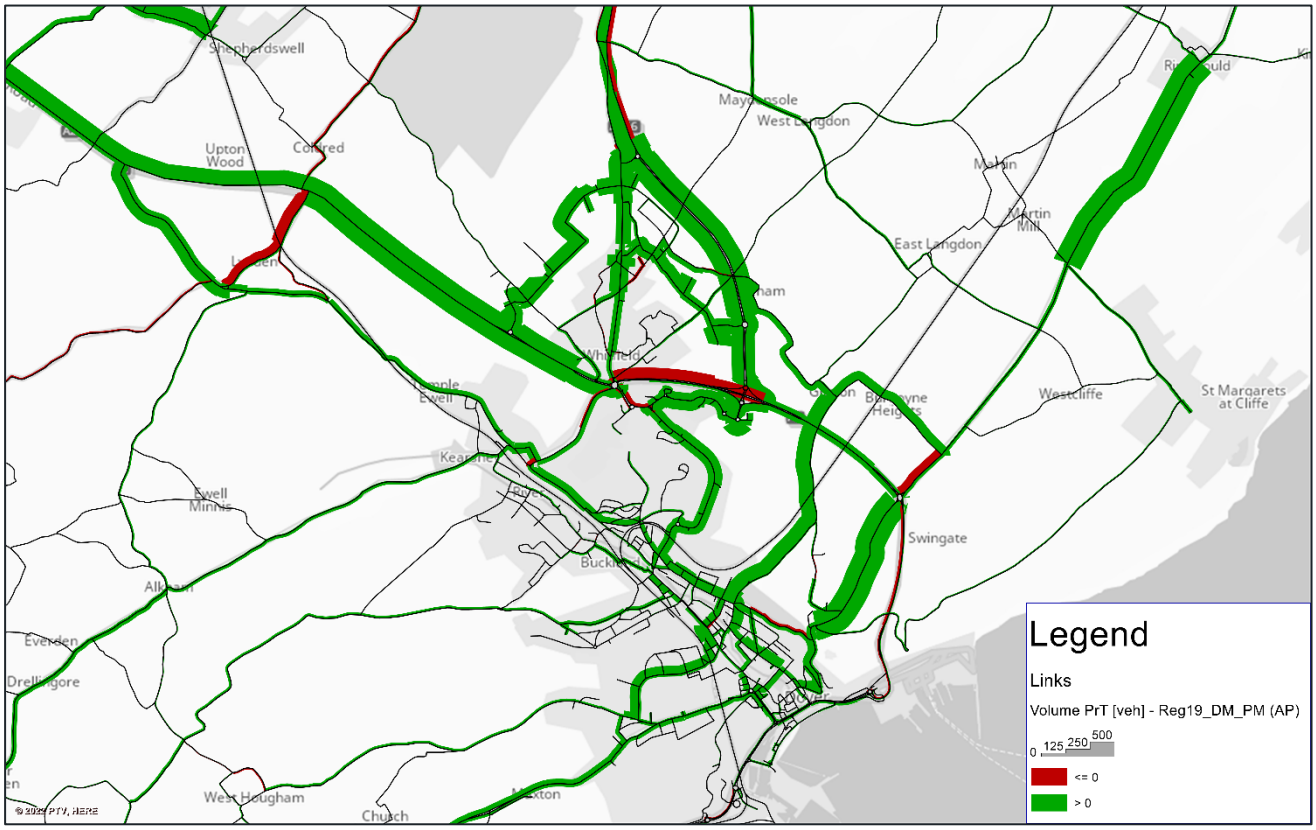


Figure 6-44: DDTM 2040 Do Something 2 No Mitigation- Do Minimum Flow Difference, Dover, PM Peak

6.6.5. Actual flow change patterns are similar to the DS1 No Mitigation during the PM peak; there are decreases in northbound flow on the A258 and increases on Dover Road through Guston. The additional Local Plan growth using this routing has been assessed in the Duke of York trigger point assessment detailed further in Appendix N, in separate document.

6.6.6. In the PM Peak, a reduction in vehicles is shown eastbound along the A2, between Whitfield roundabout and the A256 / A2 grade-separated junction. In part, this is accredited to re-routing along Dover Road and The Lane; additionally, a proportion of trips that previously accessed the A2 eastbound at Whitfield roundabout via Honeywood Parkway, now travel along Honeywood Parkway and use the A2/A256 junction. Lastly, in the DM a small number of vehicles leave the A2 to travel along Westcourt Lane and Eythorne Road, through Shepherdswell and Eythorne before joining Willow Road and Mongeham Road to access Deal. In the DS, with increases in delays at Whitfield roundabout, A2/A256 junction and Duke of York roundabout, the rural route becomes more attractive and sees an increase in vehicle volumes.

6.6.7. Figure 6-45 and Figure 6-46 present the actual flow difference between the 2040 Do Something No Mitigation and the 2040 Do Minimum in Deal in the AM Peak and PM Peak respectively. There are increases in flow travelling eastbound through Monegeham, originating from sites in Elvington, Eythorne and Whitfield. This trend is evident in the AM and PM peak however there are larger increases in the AM.

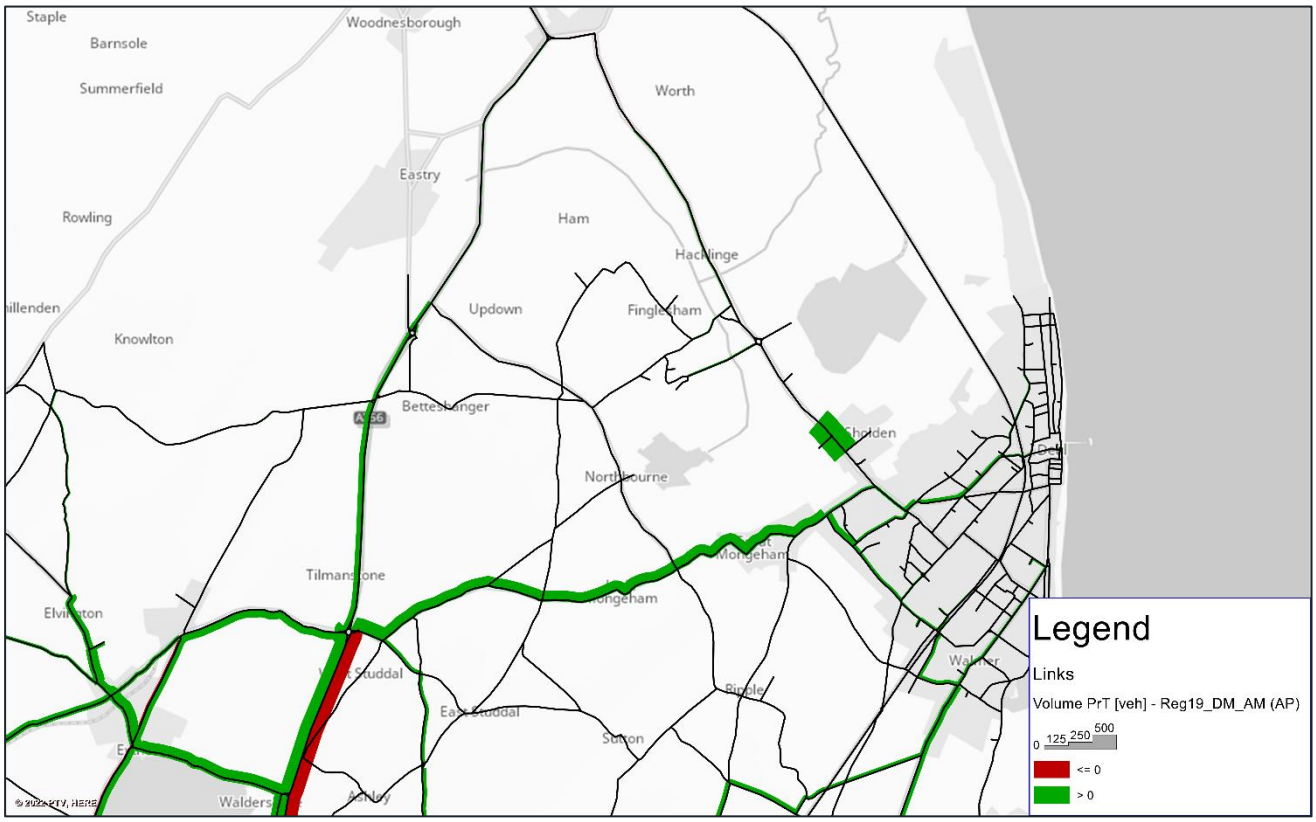


Figure 6-45: DDTM 2040 Do Something 2 No Mitigation - 2040 Do Minimum, Deal, AM Peak

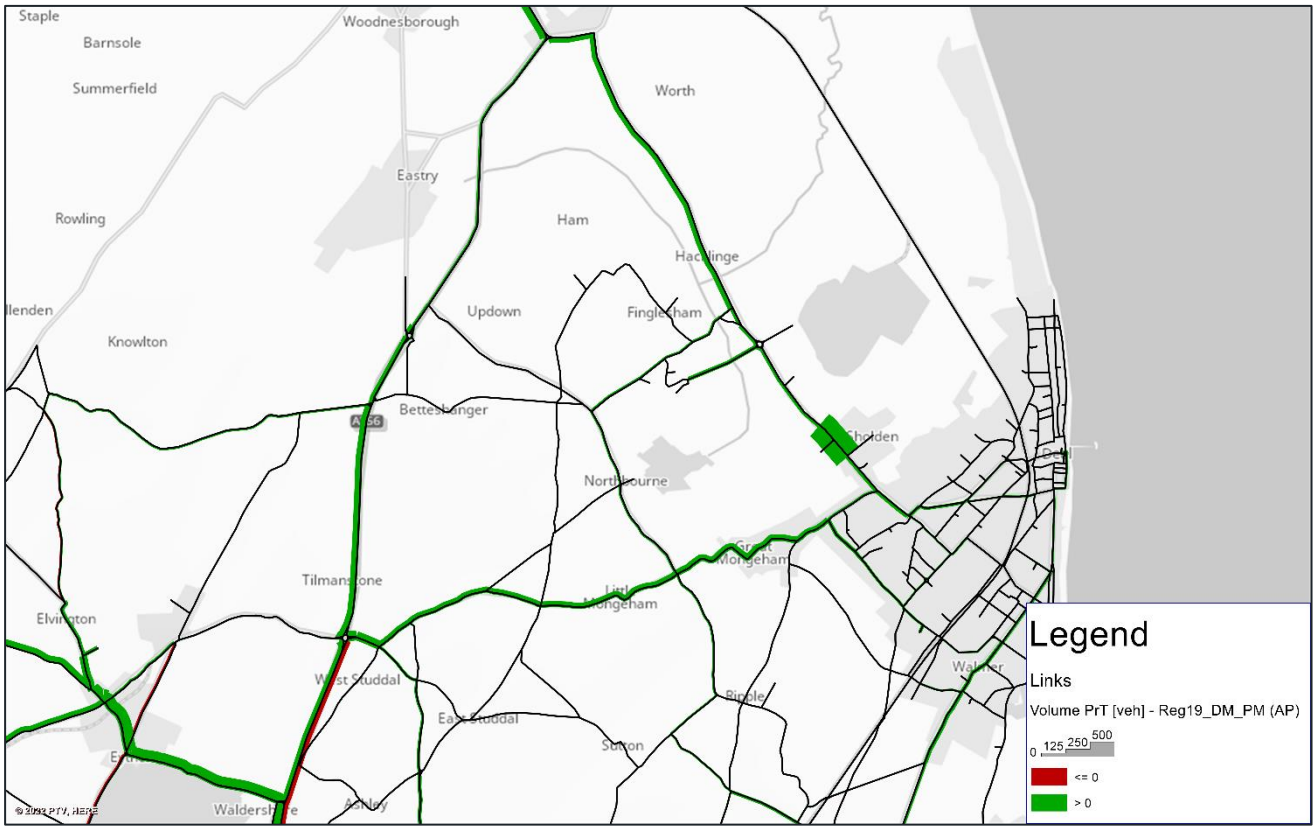


Figure 6-46: DDTM 2040 Do Something 2 No Mitigation - 2040 Do Minimum, Deal, PM Peak

6.6.8. The flow behaviour changes at the Whitfield roundabout and Duke of York roundabout were assessed using the actual flow and percentage flow difference as a point of comparison to demonstrate the arms with increases and decreases. This allowed the impacts of the Dover Local Plan sites modelled in 2040 Do Something scenario No Mitigation to be compared against the 2040 Do Minimum scenario.

6.6.9. Figure 6-47 presents the actual flow change at Whitfield Roundabout in the AM peak; there are reductions Whitfield Hill in the north and southbound directions. This is a result of increased congestion at Whitfield roundabout on most approaches to the roundabout which is resulting in traffic re-routing. For example there is a reduction in traffic travelling southbound along Sandwich Road, Whitfield Hill and Alkham Valley and they are travelling via Coldred Hill and Warren Lane instead to get to areas to the west of Dover such as West Hougham. In the northbound direction at Whitfield Hill there is a reduction in actual traffic flow because of the queueing on this approach which is generating in the DS2 scenario.

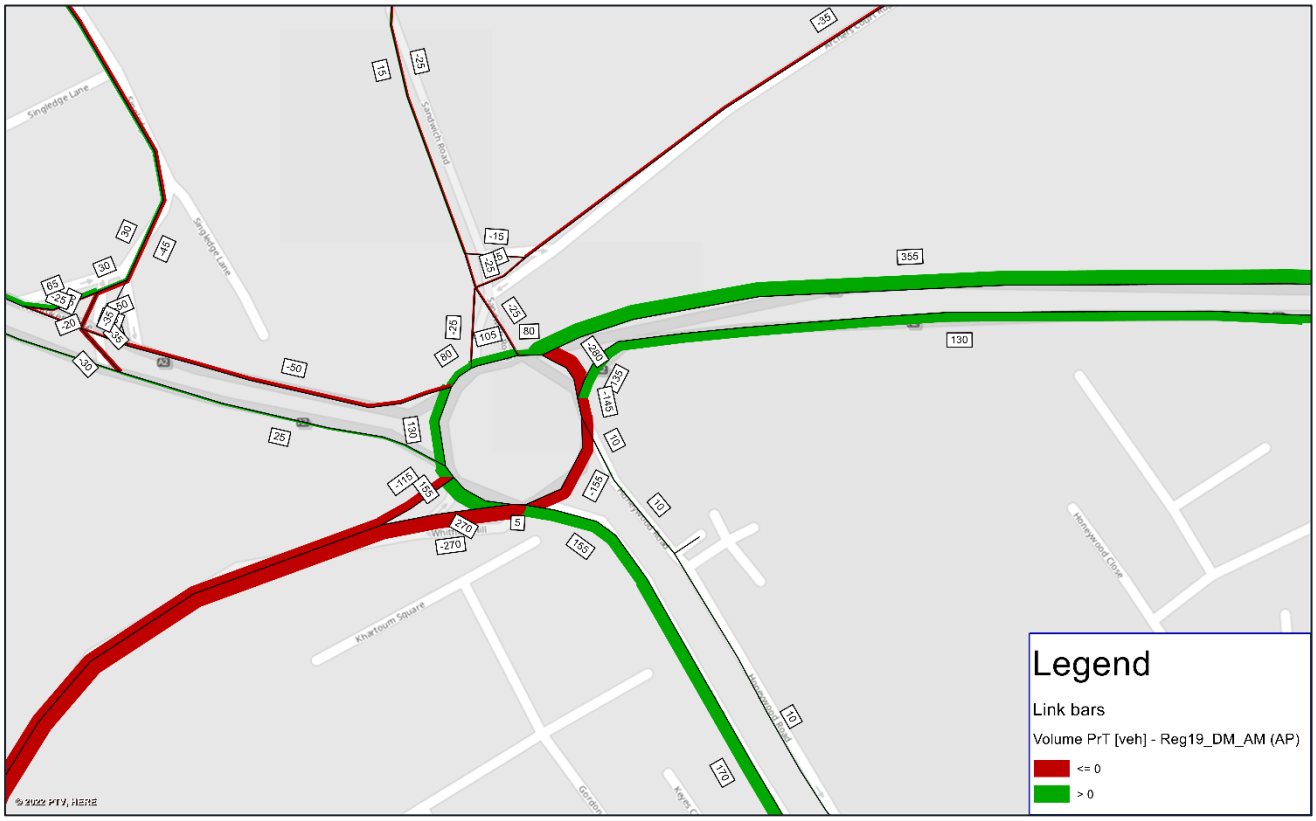


Figure 6-47: DDTM 2040 Do Something 2 No Mitigation - 2040 Do Minimum Flow Difference, Whitfield Roundabout, AM Peak

6.6.10. Figure 6-48 shows the percentage flow changes at the Whitfield roundabout in the AM peak; flows on the Whitfield Hill, Sandwich Road and A2 coastbound approach decrease by 10%, 5% and 5% respectively. As discussed above this is a result of increased congestion at Whitfield roundabout in the DS2 scenario which results in some traffic avoiding the roundabout and choosing alternative routes. An increase on the A2 eastern arm is shown to be 15% - given the growth period of 25 years, this is approximately 0.6% increase per annum.

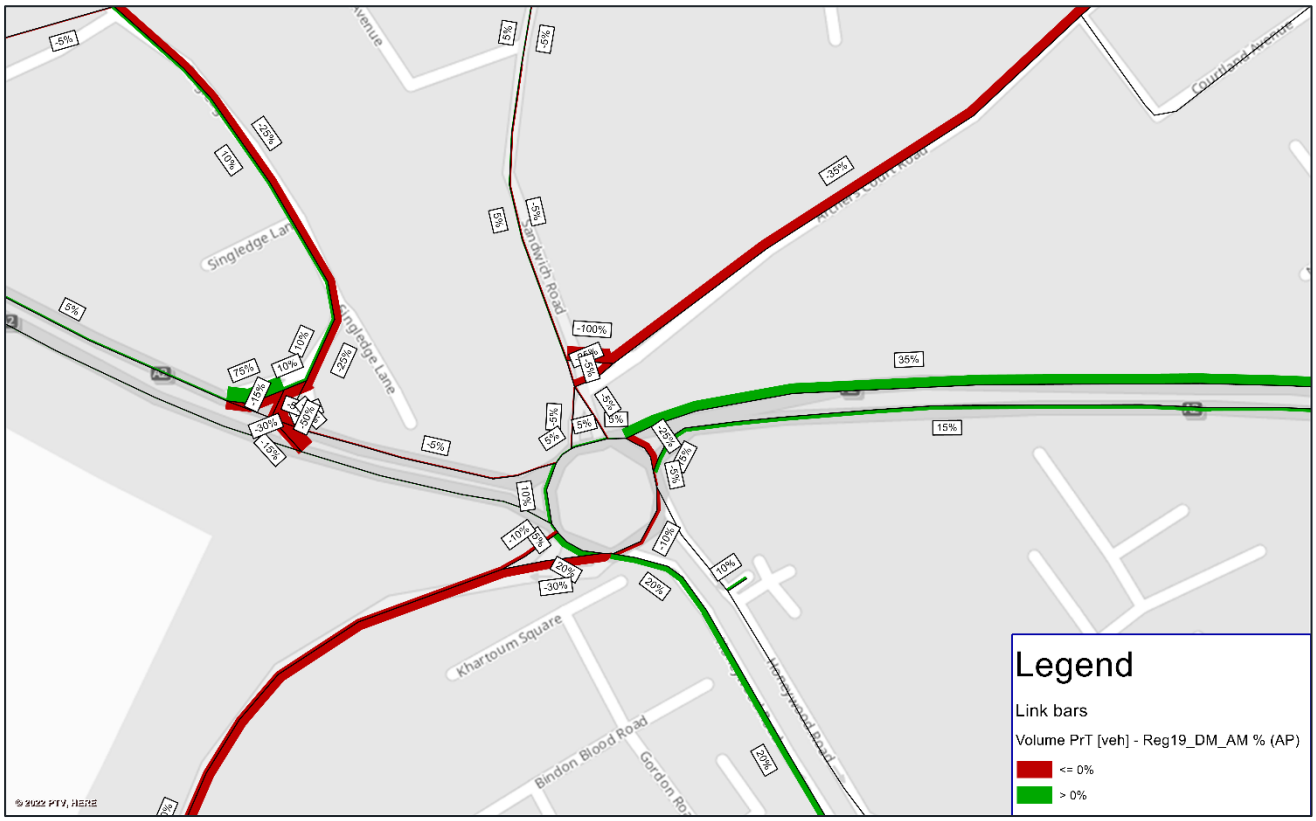


Figure 6-48: DDTM 2040 Do Something 2 No Mitigation - 2040 Do Minimum % Difference, Whitfield Roundabout, AM Peak

6.6.11. Figure 6-49 illustrates the actual flow changes at the Whitfield Roundabout in the PM Peak; flows exiting the junction onto Sandwich Road, Whitfield Hill and A2 westbound increase by 85, 150 and 115 vehicles, however a decrease of 380 vehicles on the A2 eastbound is evident.

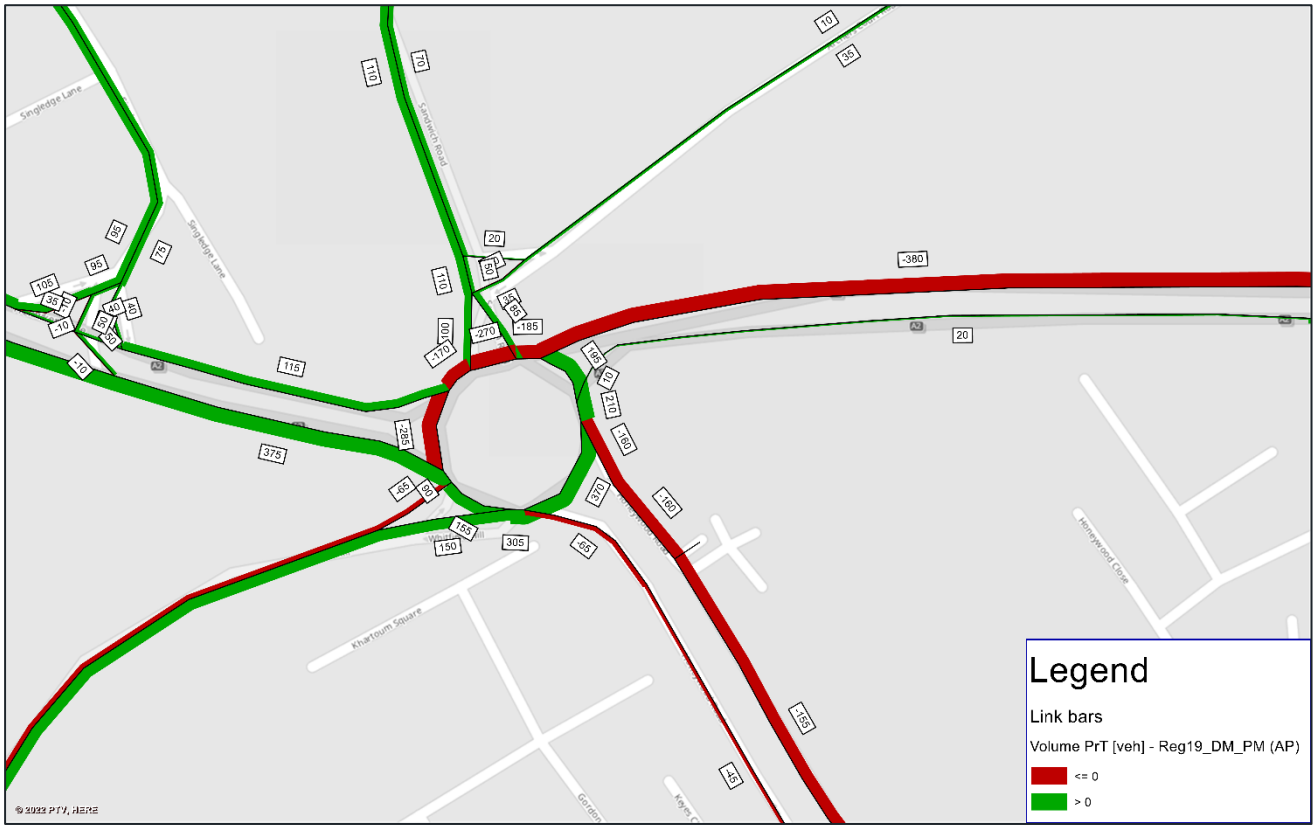


Figure 6-49: DDTM 2040 Do Something 2 No Mitigation - 2040 Do Minimum Flow Difference, Whitfield Roundabout, PM Peak

6.6.12. Figure 6-50 presents the percentage flow difference at the Whitfield roundabout in the PM peak and demonstrates an average increase of approximately 30% travelling northbound on Sandwich Road. There are reductions in traffic flow on the A2 eastbound and Honeywood Road south of 30% and 20%. As mentioned previously this junction is over capacity and any additional demand is anticipated to further exacerbate the problem and as such rerouting away from the junction.

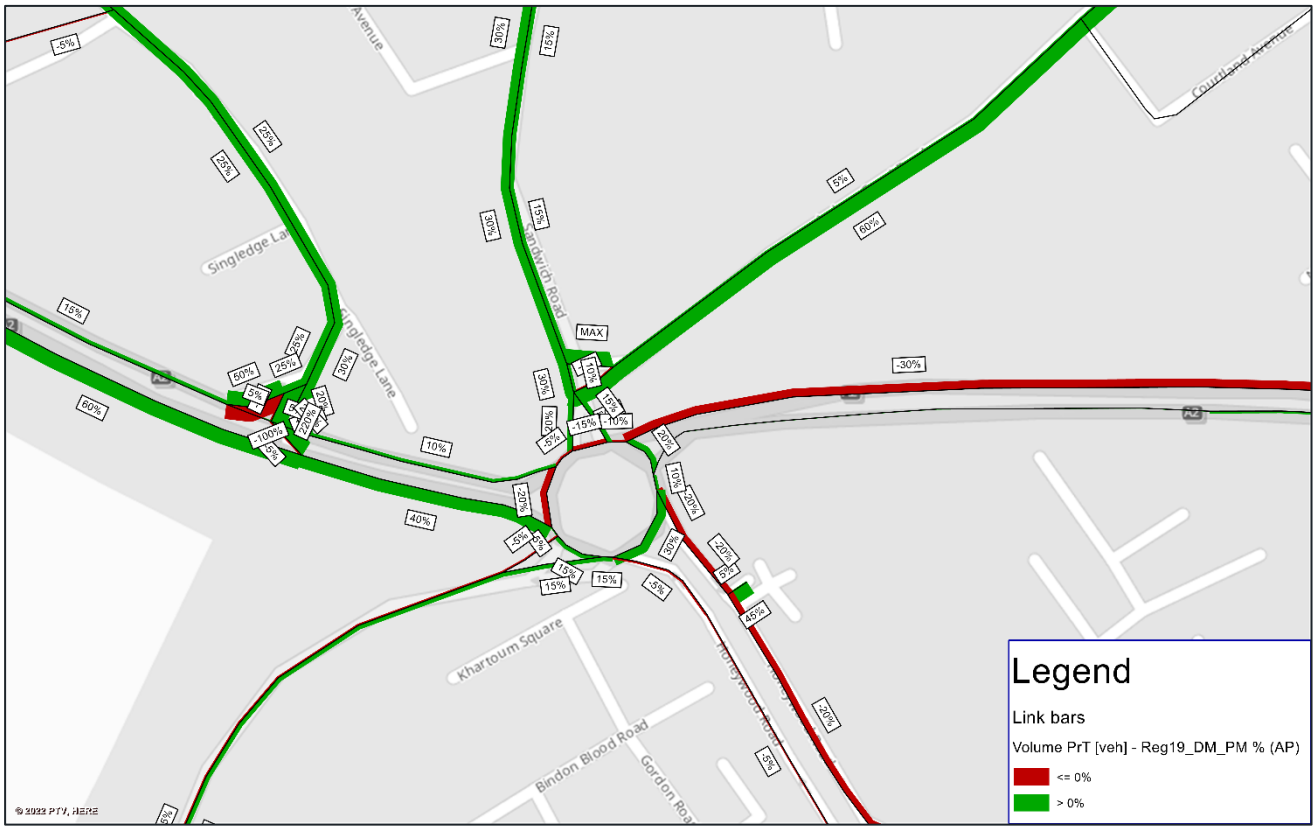


Figure 6-50: DDTM 2040 Do Something 2 No Mitigation - 2040 Do Minimum % Difference, Whitfield Roundabout, PM Peak

6.6.13. Figure 6-51 presents the actual flow increases at the Duke of York roundabout in the AM Peak. It is noted that flow differences have not been presented for the A258 south of the roundabout as this link does not have consistent numbering between DM and DS scenarios.

6.6.14. The junction sees increases of a maximum of 70 vehicles on all approaches, the relatively small increases are due to additional traffic using rural routes such as The Lane, Upper Road and Dover Road.

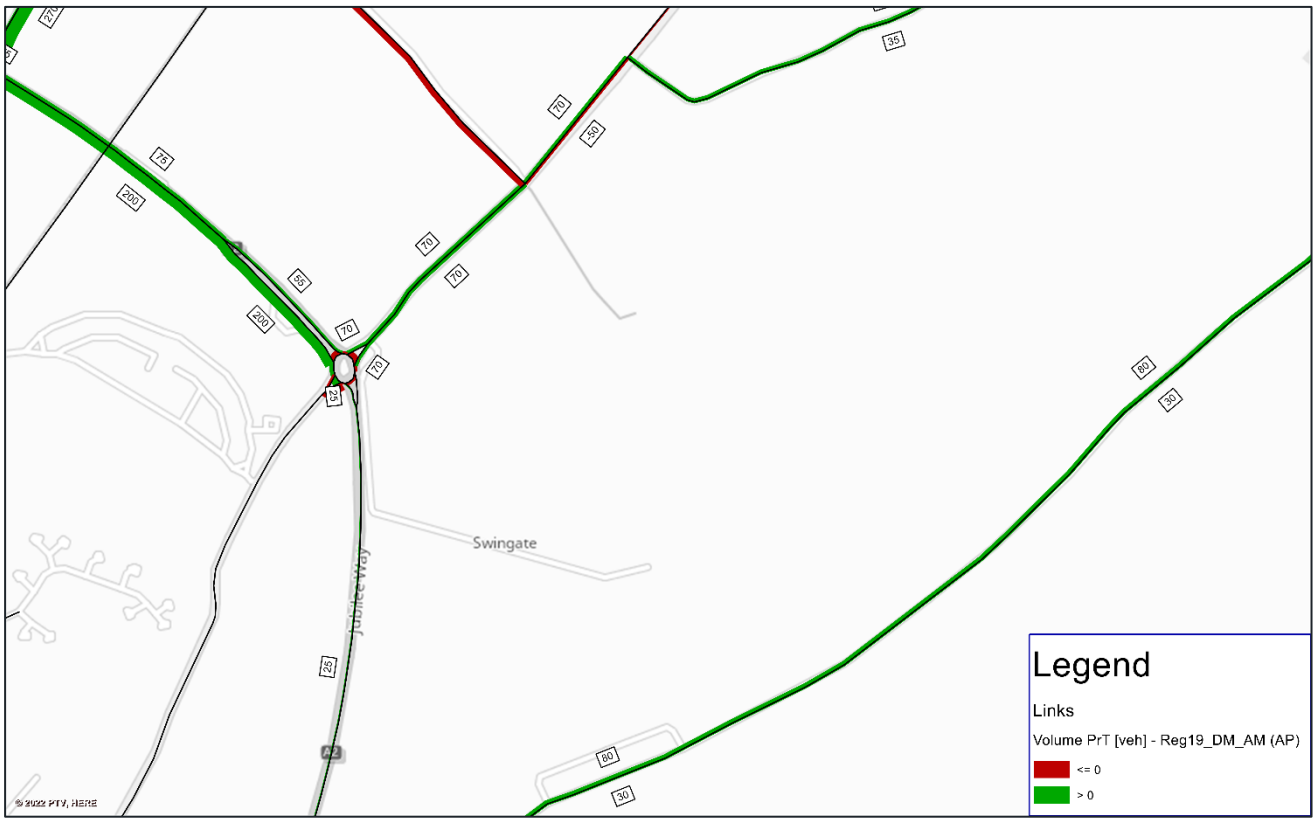


Figure 6-51: DDTM 2040 Do Something 2 No Mitigation - 2040 Do Minimum Actual Difference, DoY Roundabout, AM Peak

6.6.15. Figure 6-52 shows the percentage flow change at the Duke of York Roundabout in the AM peak; all approach arms show an increase of less than 5%.

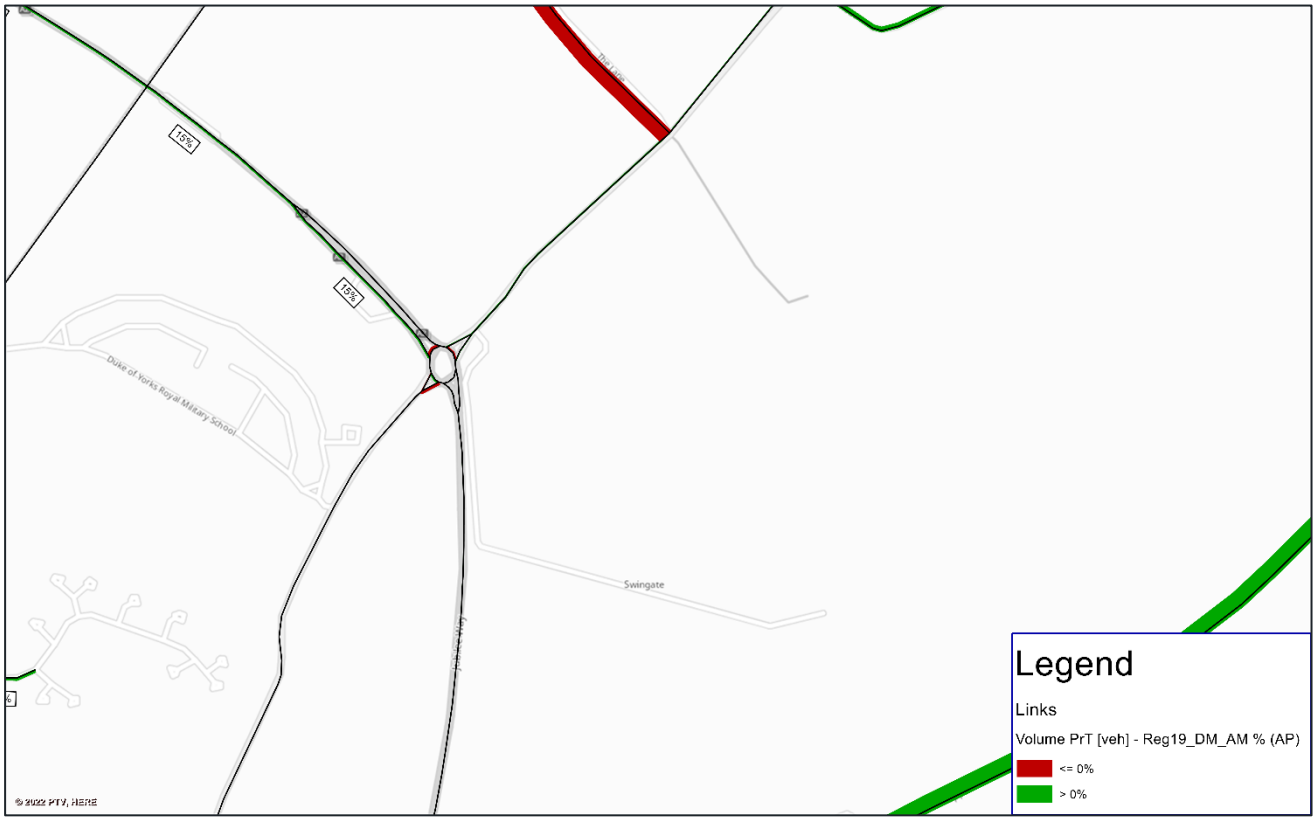


Figure 6-52: DDTM 2040 Do Something 2 No Mitigation - 2040 Do Minimum % Difference, DoY Roundabout, AM Peak

6.6.16. Figure 6-53 presents the actual flow differences at the Duke of York roundabout in the PM peak; this highlights an increase of flows on the A2 west of the junction of 255 two-way flows. The A2 Jubilee way and A258 northbound shows decreases of 80 and 265 vehicles, as with the AM peak as the junction becomes more saturated in the DS, traffic routes away from the junction and onto parallel rural routes.



Figure 6-53: DDTM 2040 Do Something 2 No Mitigation - 2040 Do Minimum Actual Difference, DoY Roundabout, PM Peak

6.6.17. Figure 6-54 presents the actual flow differences at the Duke of York roundabout in the PM peak; highlighting decreases in entry flow on the A2 Jubilee Way of 10% and exit flow on A258 northbound.

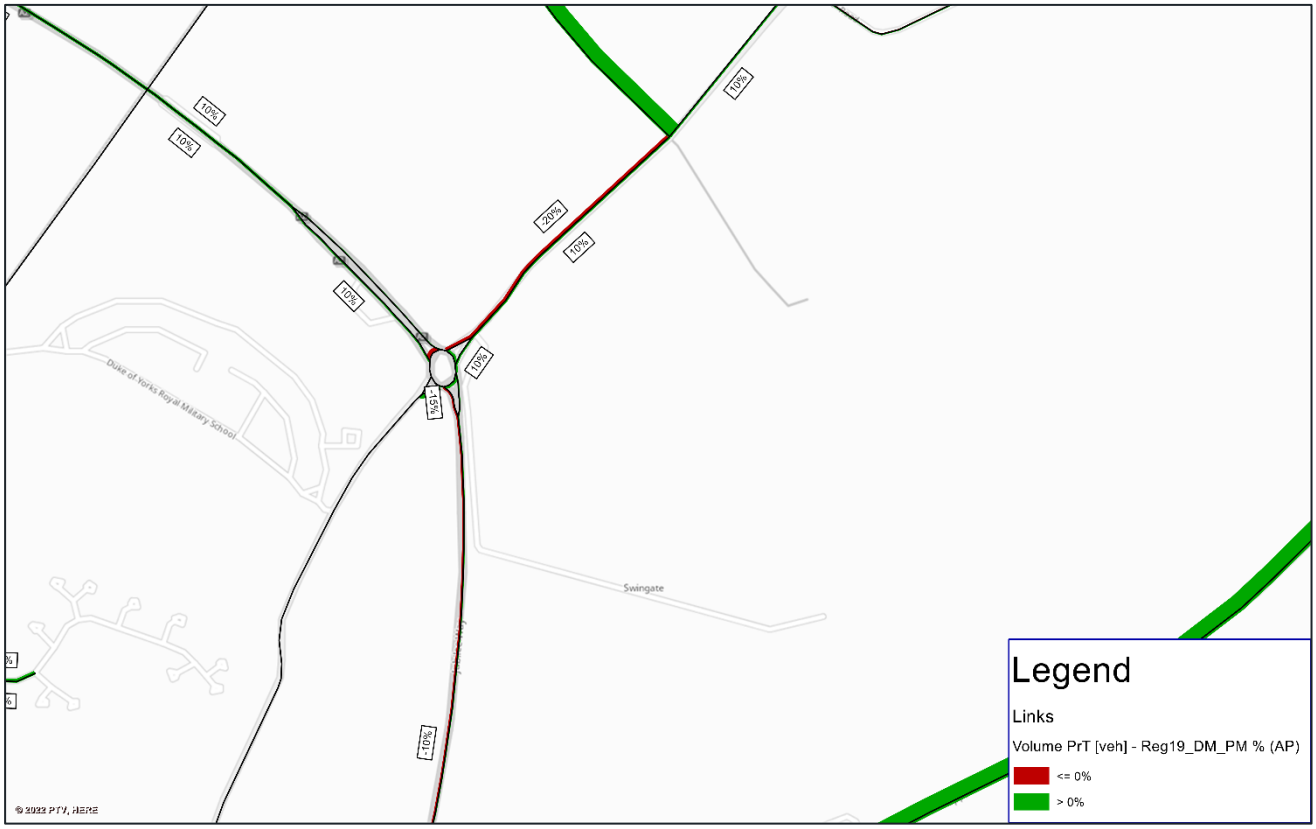


Figure 6-54: DDTM 2040 Do Something 2 No Mitigation - 2040 Do Minimum % Difference, DoY Roundabout, PM Peak

6.7 Do Something 1 with Mitigation vs Do Minimum

6.7.1. As the Local Plan full build out requires the mitigations at the Duke of York and Whitfield roundabout these mitigations have been included in the DS with mitigation scenario; an outline of the improvements is presented in Section 3.4.

6.7.2. To understand the impact the Local Plan allocations and the proposed junction mitigations at Duke of York and Whitfield roundabouts assumed, flow difference plots have been created to understand the change in actual flows as a result of the allocations and provisional infrastructure along the network.

6.7.3. Some large increases are accredited to instances whereby new transport infrastructure has been coded into the Do Something scenario and as such all flow on a new link is therefore an increase. The link flow changes across the network are the same as those between the DS without mitigation and DM. These are illustrated in **Figure 6-55** by red links.



Figure 6-55: DDTM 2040 Do Something New Links

6.7.4. Figure 6-56 presents the actual flow difference between the 2040 Do Something and 2040 Do Minimum in Dover in the AM Peak. It is noted that these figures do not include labels and have instead been presented to show the broad patterns in flow increase / decrease and on which roads these occur.

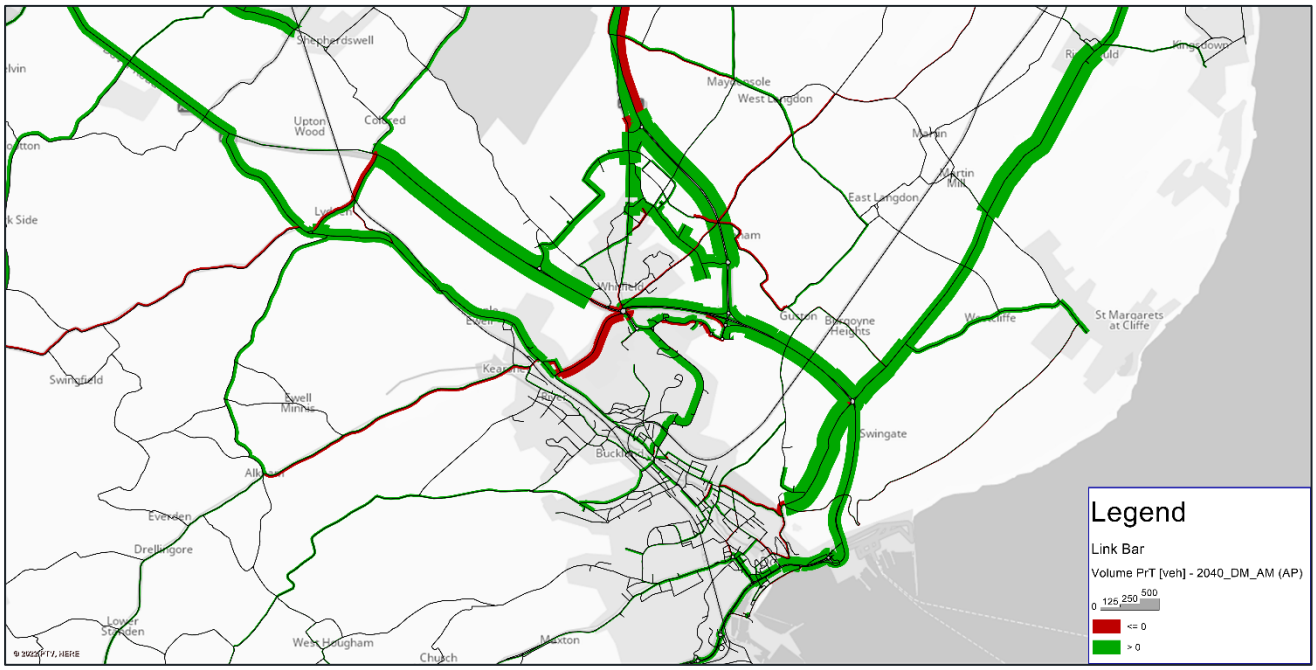


Figure 6-56: DDTM 2040 Do Something 1 with Mitigation – Do Minimum Flow Difference, Dover, AM Peak

6.7.5. Detailed investigation into the AM flow differences presented in Figure 6-56, and the subsequent re-routing of vehicles as a result of implementing the potential Local Plan allocations and junction improvements. As a result of the Duke of York junction improvements there are increases in traffic demand along the A258 and reductions in traffic on some of the local roads between the A256 and A258. This indicates that the Duke of York junction improvement encourages traffic to use the strategic road network instead of local roads. There are some flow reductions around Whitfield roundabout which is a result of the signalisation of the roundabout. Changes in flow are minimal, mainly under 100 vehicles. On some arms of the junction traffic flows do increase compared to DS1 without mitigation indicating the junction improvements are attracting traffic back to the roundabout. TRANSYT modelling of both Duke of York and Whitfield roundabouts using traffic flows from the VISUM models has been undertaken and agreed with NH and KCC as discussed in Chapter 8. There are increases in traffic on the proposed Whitfield development highway network.

6.7.6. White Cliffs Business Park is a significant trip attractor in the AM Peak, due to the large provision of jobs at this site, and some vehicles access via the A2 / A256 grade separated junction.

6.7.7. Figure 6-57 presents the actual flow difference between the 2040 Do Something and 2040 Do Minimum in Dover in the PM Peak. Similar to the AM Peak, that these figures do not include labels and have instead been presented to show the broad patterns in flow increase / decrease and on which roads these occur.

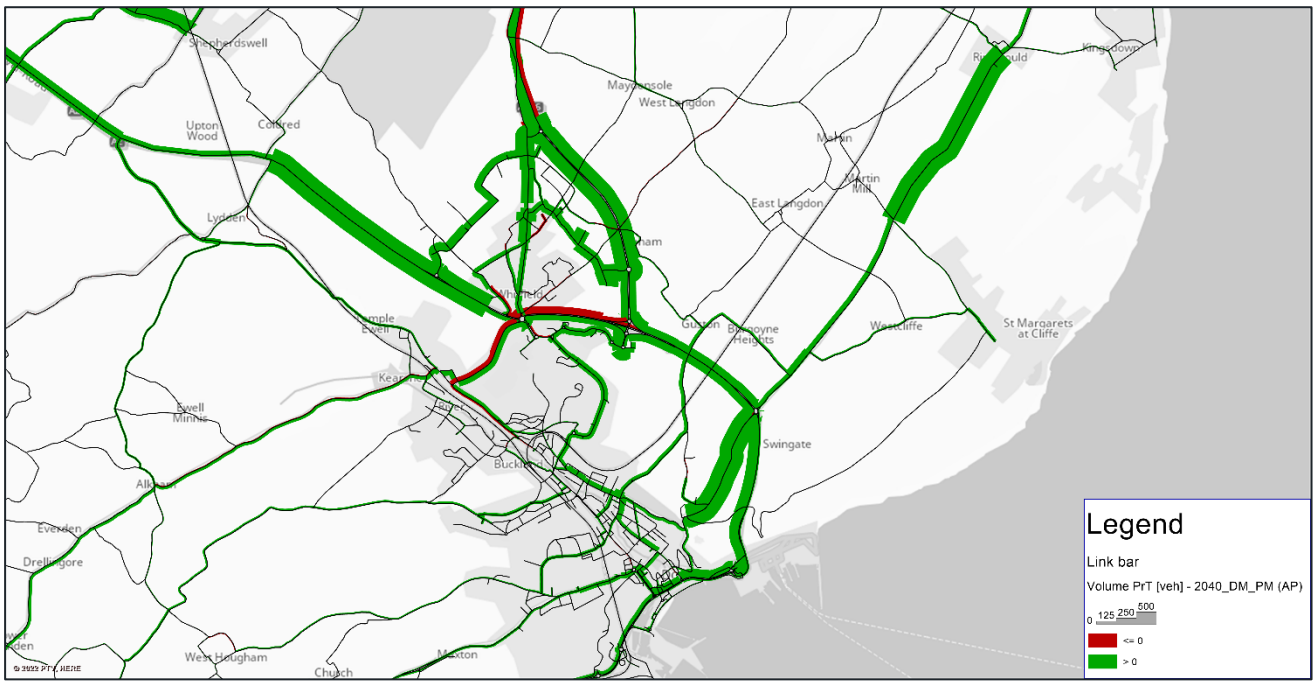


Figure 6-57: DDTM 2040 Do Something 1 with Mitigation – Do Minimum Flow Difference, Dover, PM Peak

6.7.8. Similar to the AM Peak, there are increases at all approaches to the Duke of York roundabout, with the largest increases of flow on the A2 Jubilee Way routing away from Dover. As there is a tidal pattern of employment trips compared with the AM peak.

6.7.9. In the PM Peak, a reduction in vehicles is shown eastbound along the A2, between Whitfield roundabout and the A256 / A2 grade-separated junction. In part, this is accredited to re-routing along Melbourne Avenue and Honeywood Parkway instead of Whitfield Hill and additionally, a proportion of trips that previously accessed the A2 eastbound at Whitfield roundabout via Honeywood Parkway, now travel along Honeywood Parkway and use the A2/A256 junction.

6.7.10. Figure 6-58 and Figure 6-59 present the actual flow difference between the 2040 Do Something and the 2040 Do Minimum in Deal in the AM Peak and PM Peak respectively. Generally, the Deal area shows less significant increases and decreases in vehicle volumes, compared with Dover, as a result of including the potential Local Plan development allocations.

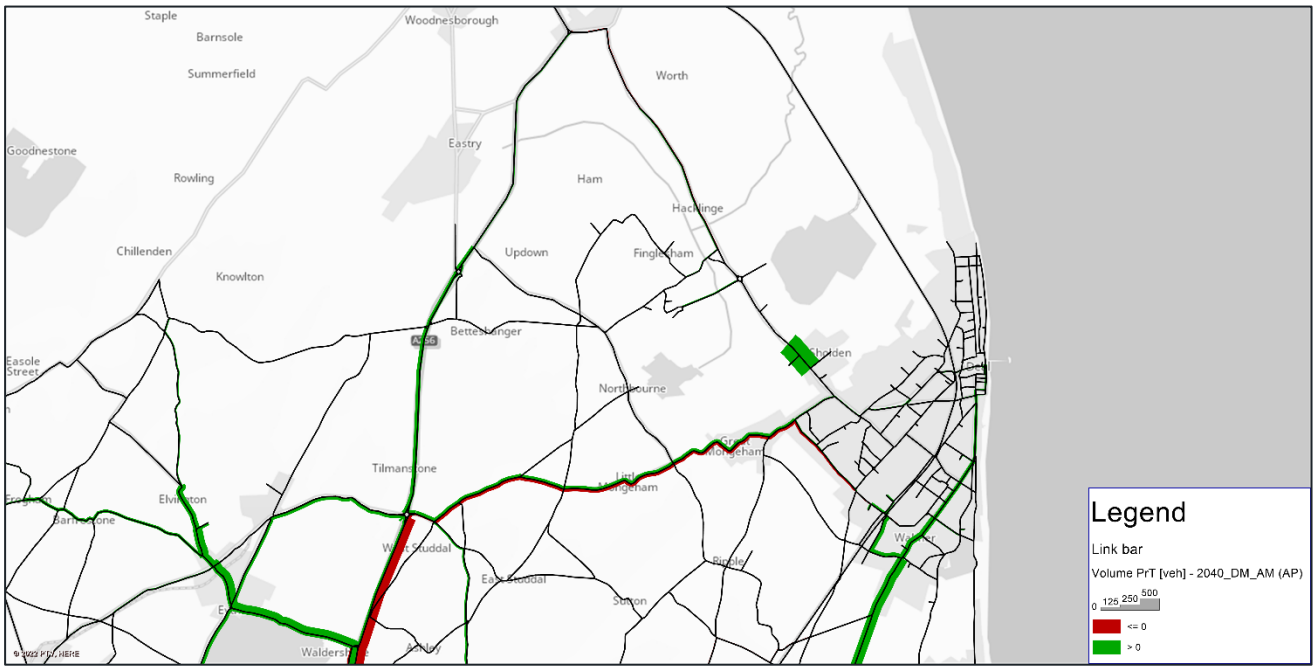


Figure 6-58: DDTM 2040 Do Something 1 with Mitigation - 2040 Do Minimum, Deal, AM Peak



Figure 6-59: DDTM 2040 Do Something 1 with Mitigation - 2040 Do Minimum, Deal, PM Peak

6.7.11. As with the Do Something No Mitigation vs DM assessment, junctions of interest were assessed using the actual flow and percentage flow difference as a point of comparison to demonstrate the arms with increases and decreases. This allowed the impacts of the Dover Local Plan sites and the junction mitigations in 2040 Do Something scenario to be compared against the 2040 Do Minimum scenario.

6.7.12. It is worth noting that the DS improvements agreed at Whitfield Roundabout are a nil detriment scheme to ensure the junction performance with the additional Local Plan growth is the same or better than that of the DM. Whilst there are some reductions in flows using the junction there are reductions of queues on some approaches of between 2 and 34 vehicles in the AM and PM.

6.7.13. Figure 6-60 presents the actual flow change at Whitfield Roundabout in the AM peak; there are reductions of flows on Sandwich Road northbound of 120 vehicles; as this approach arm is not signalised as part of the junction mitigations flow on this approach will have to wait longer for an appropriate gap to enter the junction. Reductions are observed on A2 west approach and Whitfield Hill of 125 and 145 respectively. This is due to the signalisation of the junction. Details on the changes in flows as a result of no mitigation is detailed in section 6.11.

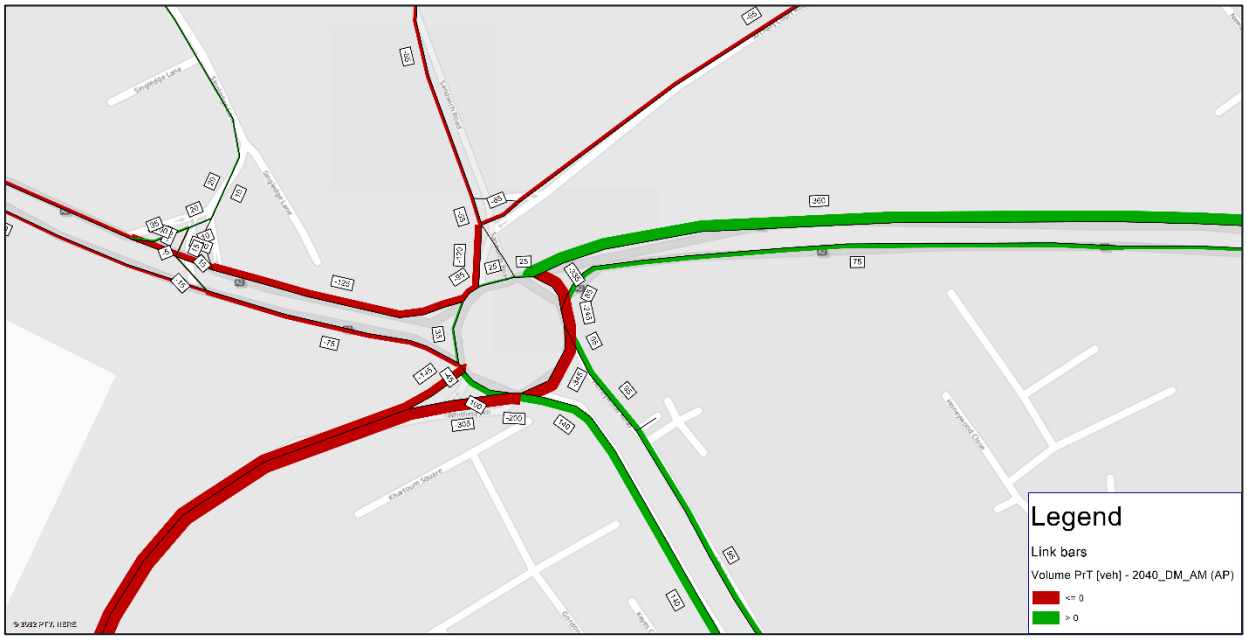


Figure 6-60: DDTM 2040 Do Something 1 with Mitigation - 2040 Do Minimum Flow Difference, Whitfield Roundabout, AM Peak

6.7.14. Figure 6-61 shows the percentage flow changes at the Whitfield roundabout in the AM peak; flows on the Whitfield Hill and A2 coastbound approach decrease by 15% and 10% respectively, an increase on the A2 eastern arm is shown to be 10% - given the growth period of 25 years, this is approximately 0.4% increase per annum.

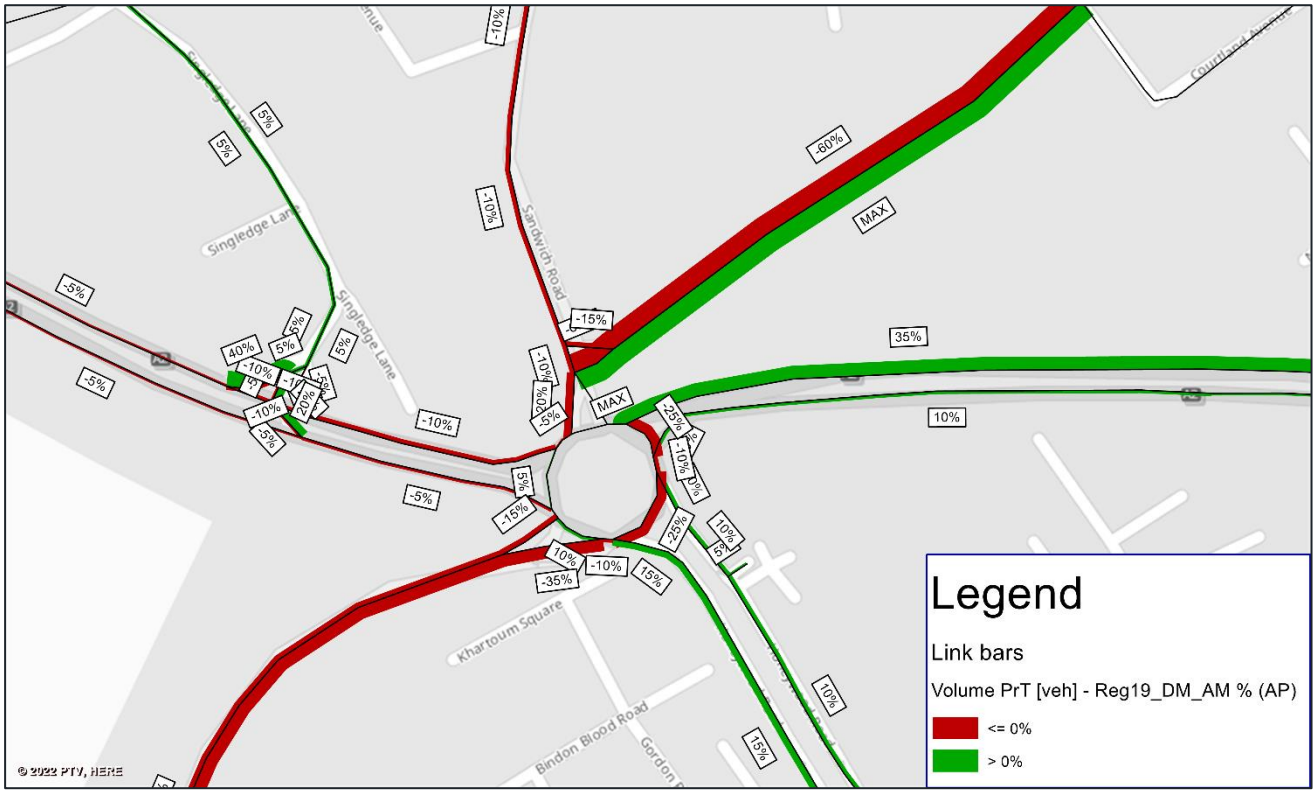


Figure 6-61: DDTM 2040 Do Something 1 with Mitigation - 2040 Do Minimum % Difference, Whitfield Roundabout, AM Peak

6.7.15. Figure 6-63 illustrates the actual flow changes at the Whitfield Roundabout in the PM Peak; flows along the A2 Westbound increase by approximately 140 vehicles, however a decrease of 315 vehicles using the A2 Eastbound is evident.

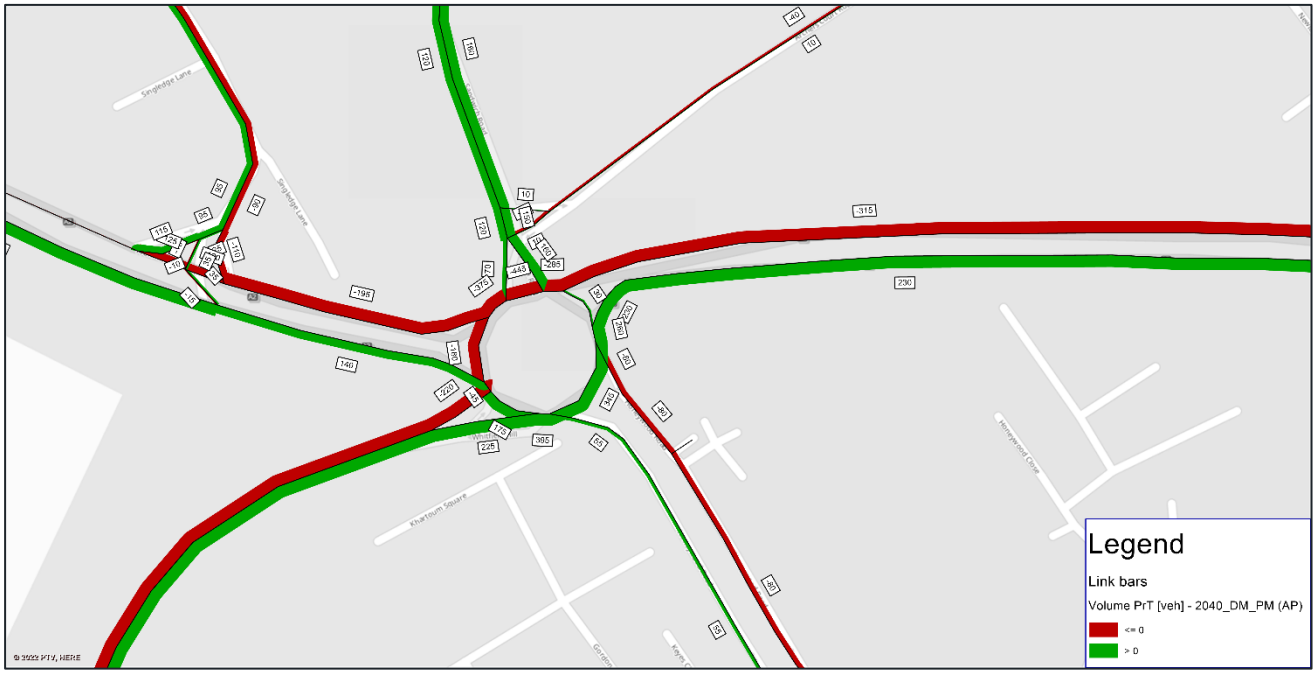


Figure 6-62: DDTM 2040 Do Something 1 with Mitigation - 2040 Do Minimum Flow Difference, Whitfield Roundabout, PM Peak

6.7.16. Figure 6-63 presents the percentage flow difference at the Whitfield roundabout in the PM peak and demonstrates an average increase of approximately 35% travelling northbound on Sandwich Road. A reduction of flows on the A2 Eastbound ranges between 20% - 25%.

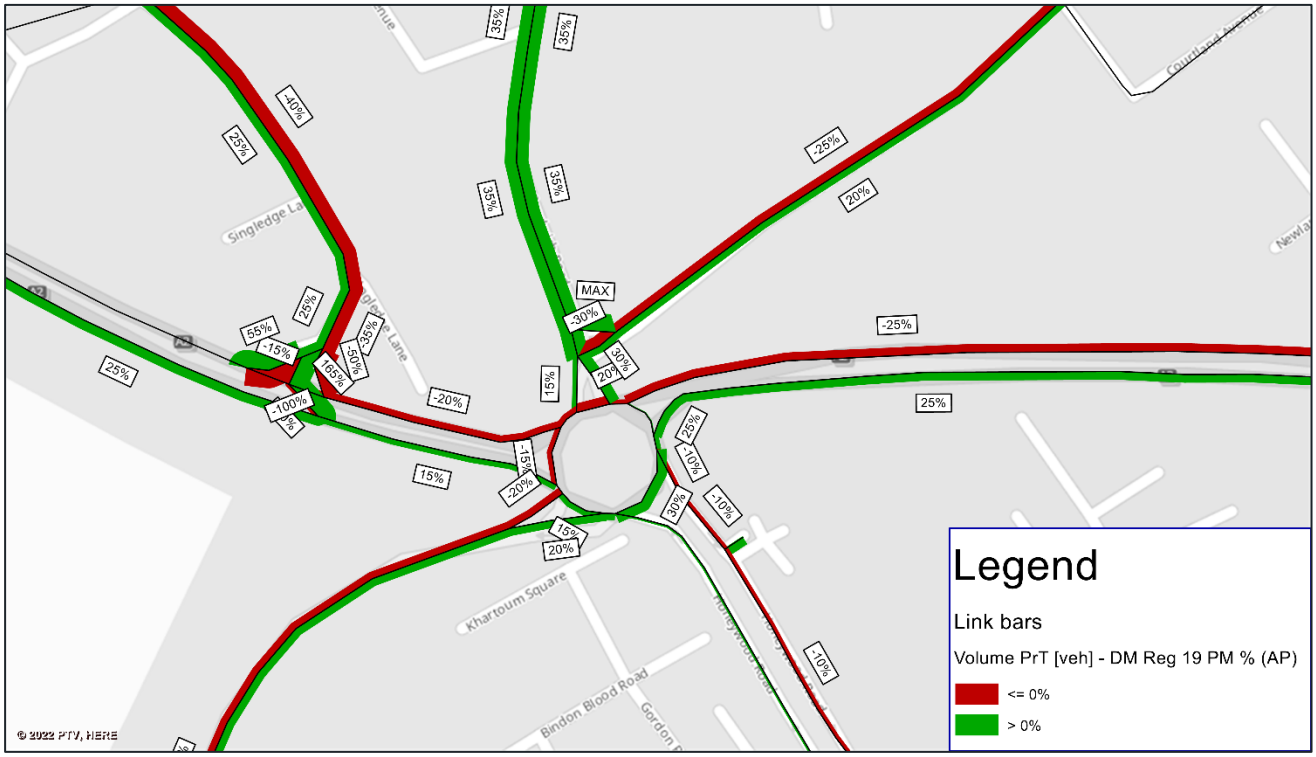


Figure 6-63: DDTM 2040 Do Something 1 with Mitigation - 2040 Do Minimum % Difference, Whitfield Roundabout, PM Peak

6.7.17. Figure 6-64 presents the actual flow increases at the Duke of York roundabout in the AM Peak. It is noted that flow differences have not been presented for the A258 south of the roundabout as this link does not have consistent numbering between DM and DS scenarios.

6.7.18. Increases in vehicle volumes westbound along the A2 are accredited to employment trips wishing to access White Cliffs Business Park at the A256/A2 junction to the west, and residential trips leaving the nearby Connaught Barracks site.

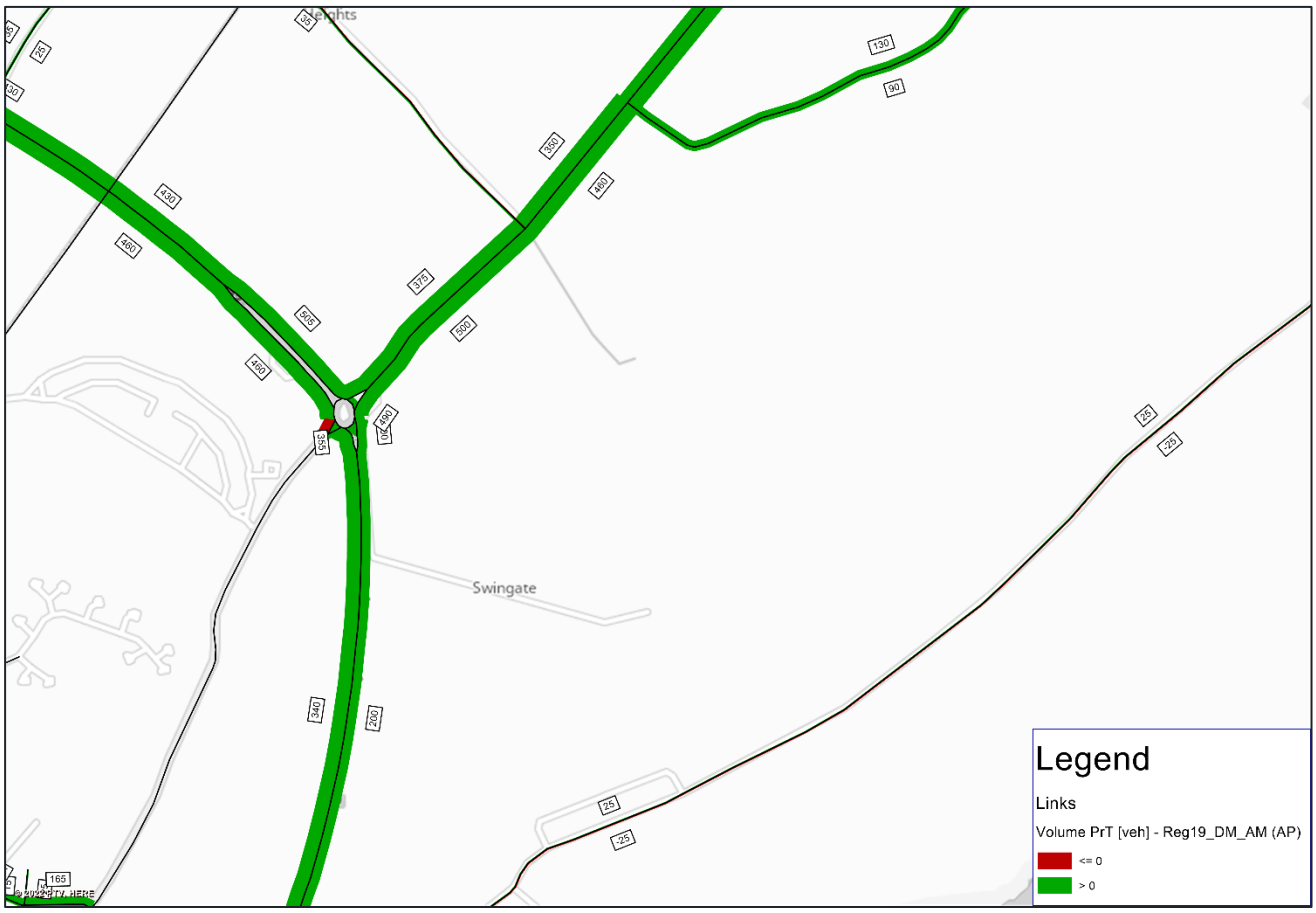


Figure 6-64: DDTM 2040 Do Something 1 with Mitigation - 2040 Do Minimum Actual Difference, DoY Roundabout, AM Peak

6.7.19. Figure 6-65 shows the percentage flow change at the Duke of York Roundabout in the AM peak; there are increases on all approaches between 35 – 55%. This is as a result of the junction improvements proposed alongside the Local Plan growth, and traffic being attracted back to the strategic road network rather than using local rat-running routes.

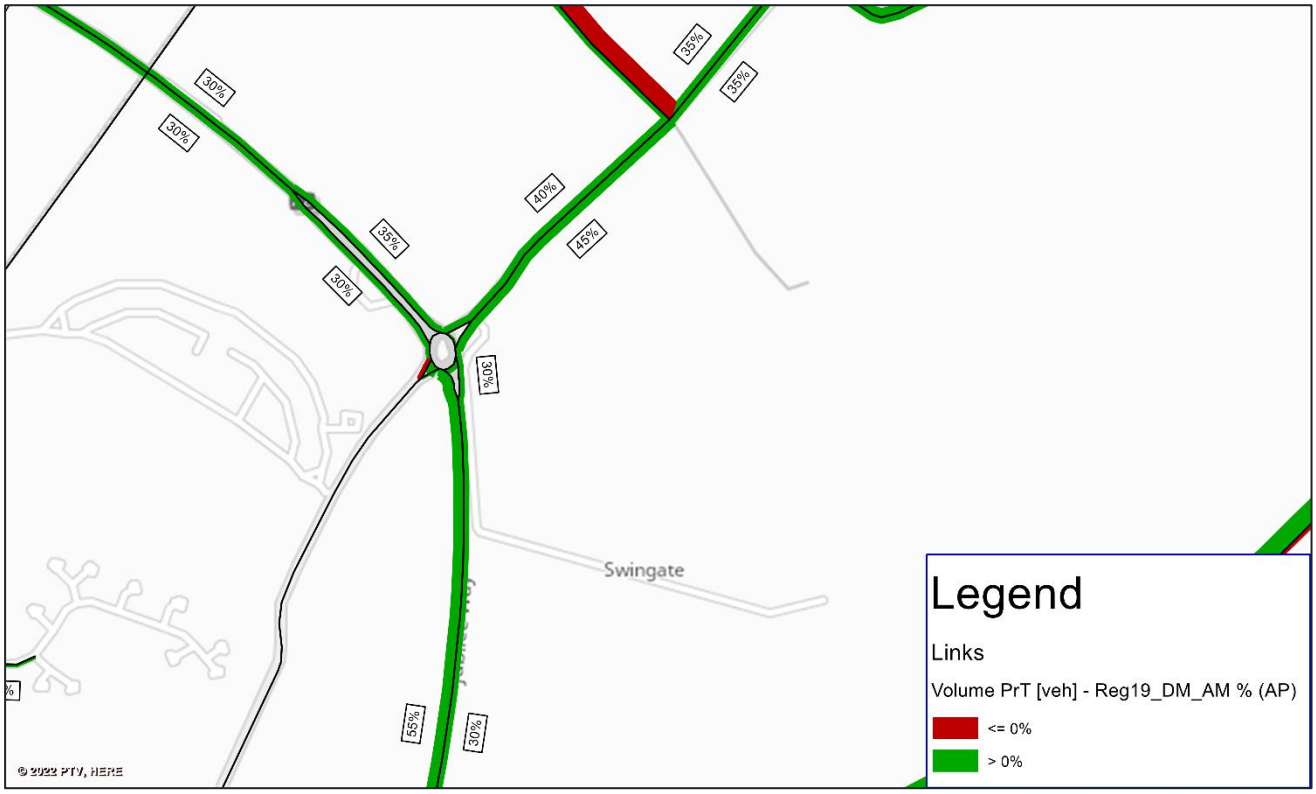


Figure 6-65: DDTM 2040 Do Something 1 with Mitigation - 2040 Do Minimum % Difference, DoY Roundabout, AM Peak

6.7.20. Figure 6-66 presents the actual flow differences at the Duke of York roundabout in the PM peak; this highlights an increase of flows on all entry and exit arms, with the largest increases on the A2 mainline.

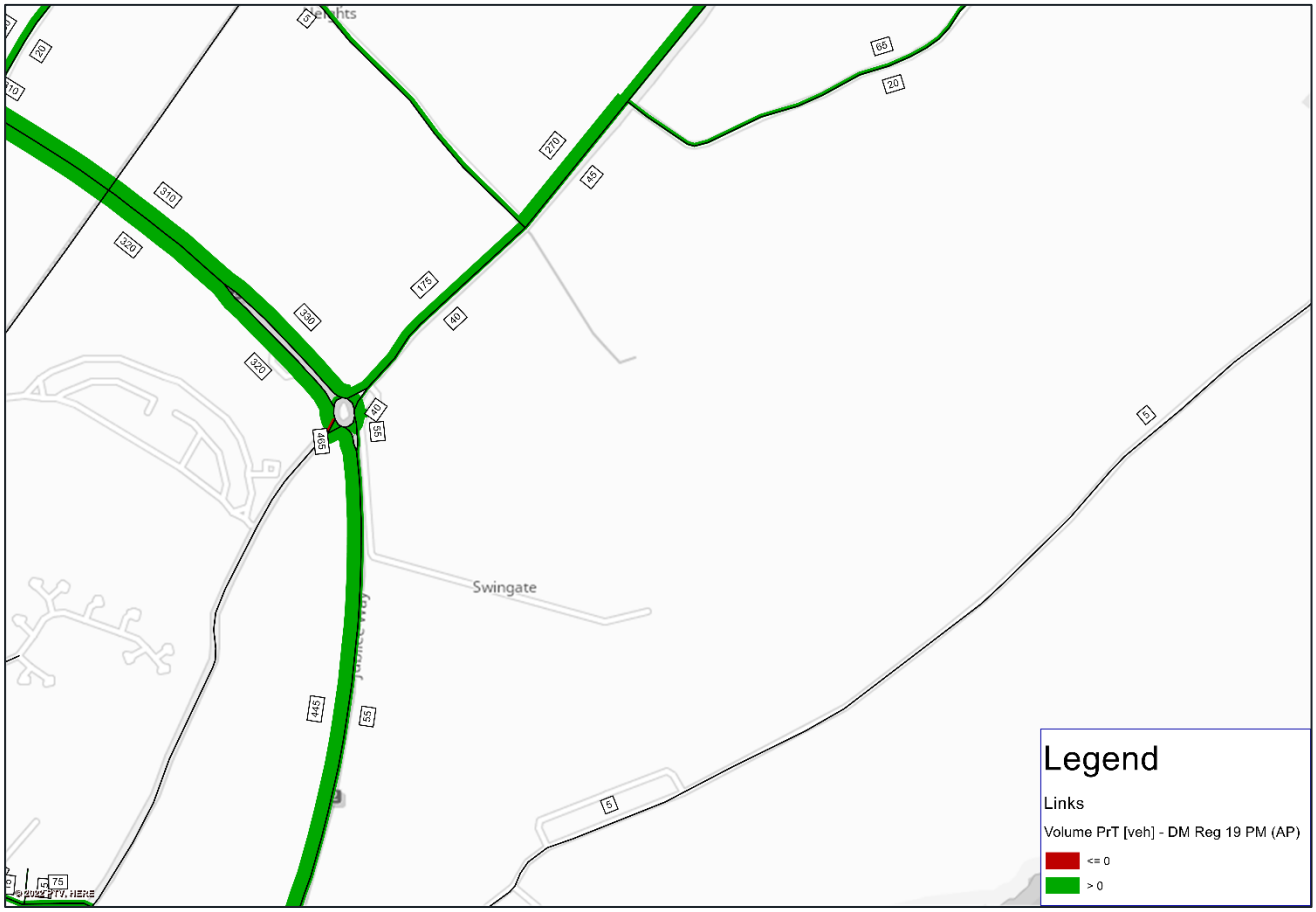


Figure 6-66: DDTM 2040 Do Something 1 with Mitigation - 2040 Do Minimum Actual Difference, DoY Roundabout, PM Peak

6.7.21. Figure 6-67 shows the percentage flow changes at the Duke of York roundabout in the PM peak; there are increases on the A2 approaches between 25% and 60%. The increases on Deal Road are not as substantial as those presented in the AM peak, however increased northbound flow is detailed as a result of returning trips from Dover towards residential areas in Deal during the PM peak.

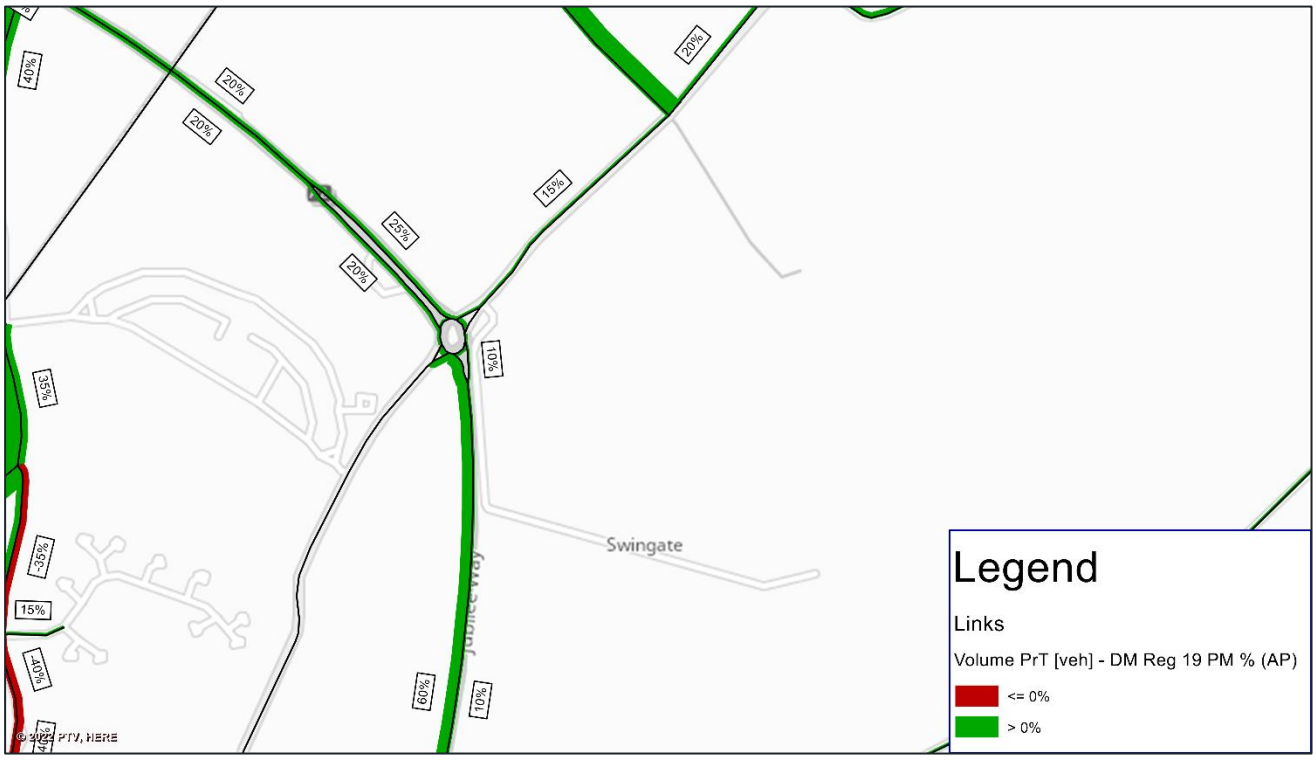


Figure 6-67: DDTM 2040 Do Something 1 with Mitigation - 2040 Do Minimum % Difference, DoY Roundabout, PM Peak

6.7.22. Figure 6-68 presents the actual flow differences at the London Road/ Manor Road roundabout in Deal in the AM peak. For all arms travelling in the direction of Deal town centre an increase in traffic flows between 35 – 40 is evident.

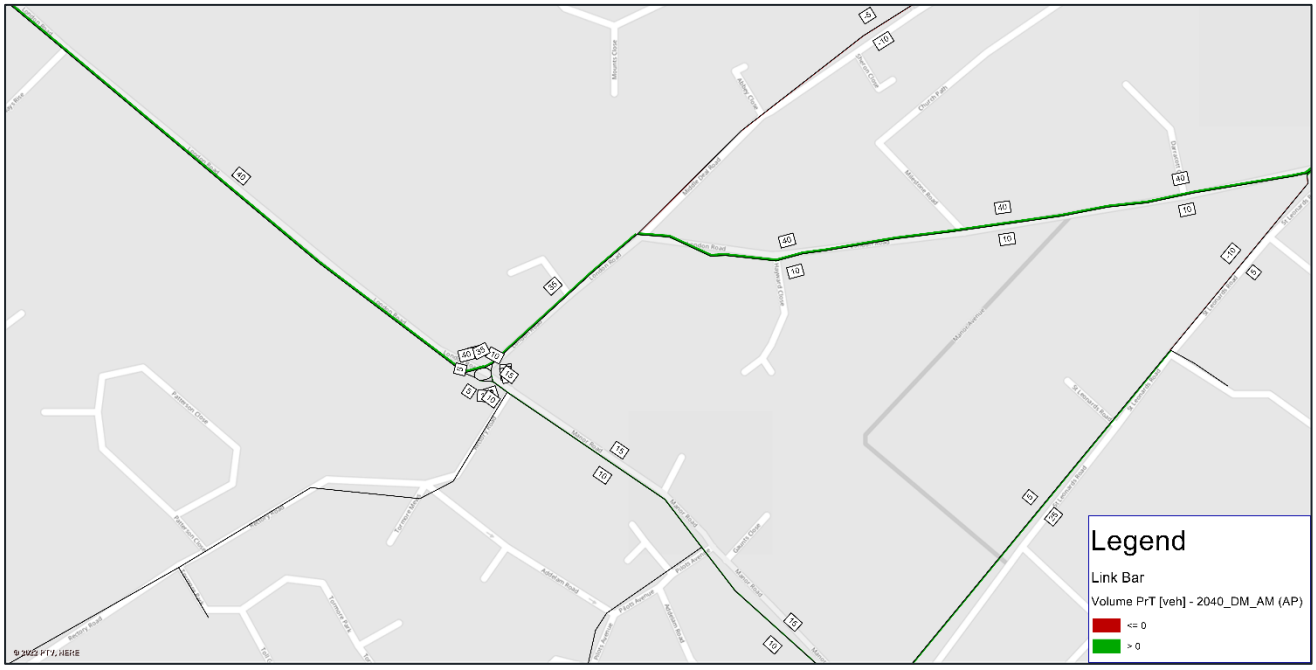


Figure 6-68: DDTM 2040 Do Something 1 with Mitigation - 2040 Do Minimum Actual Difference, London Road , AM Peak

6.7.23. Figure 6-69 presents the percentage flow changes in the Do Something 1 scenario at the London Road/ Manor Road roundabout in the AM peak; an increase of flows of 5% is evident for traffic using the A258 Southbound towards Deal, these increases are likely due to the Duke of York junction improvement scheme attracting traffic onto the main routes rather than ratrunning.

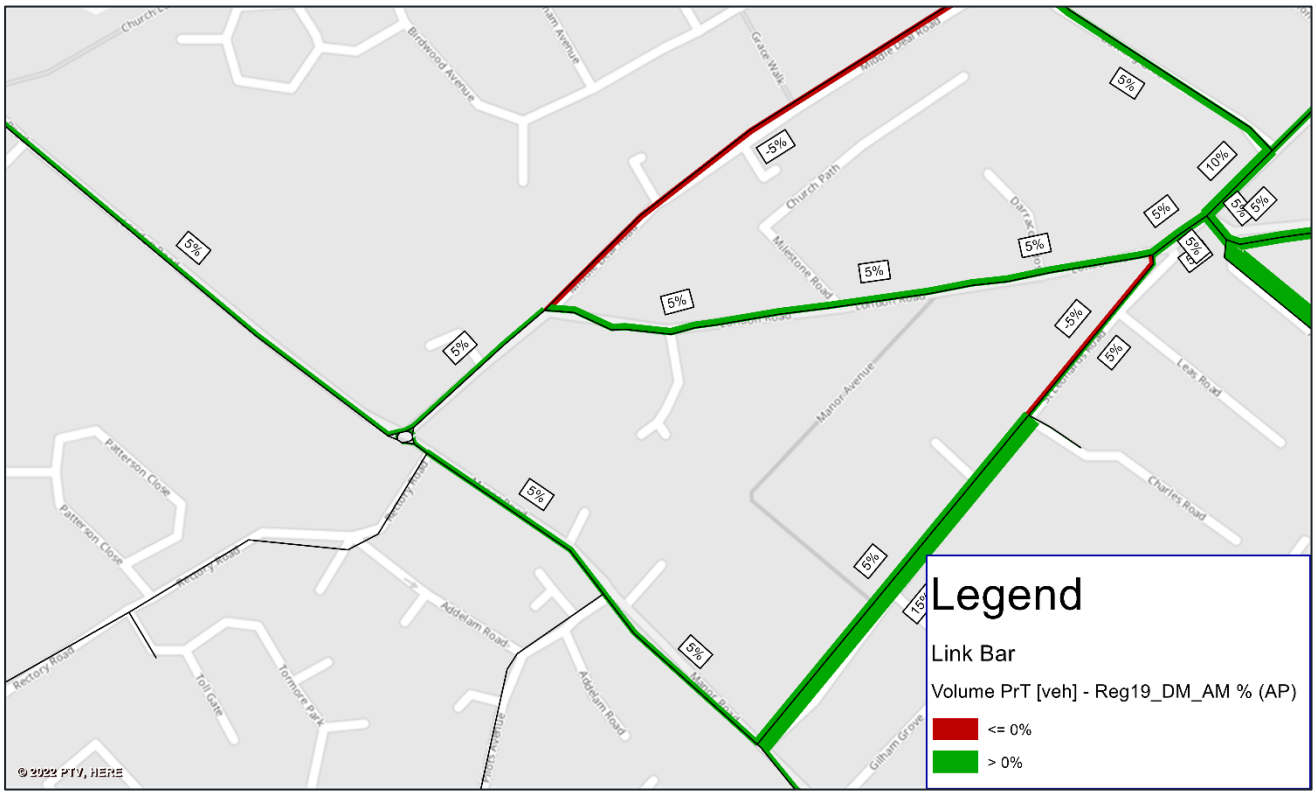


Figure 6-69: DDTM 2040 Do Something 1 with Mitigation - 2040 Do Minimum % Difference, London Road, AM Peak

6.7.24. Figure 6-70 shows the actual flow differences for the London Road Roundabout in the PM peak; all arms show an increase of flows ranging between 5-105 vehicles. The largest increase in flows is evident on London Road northbound.

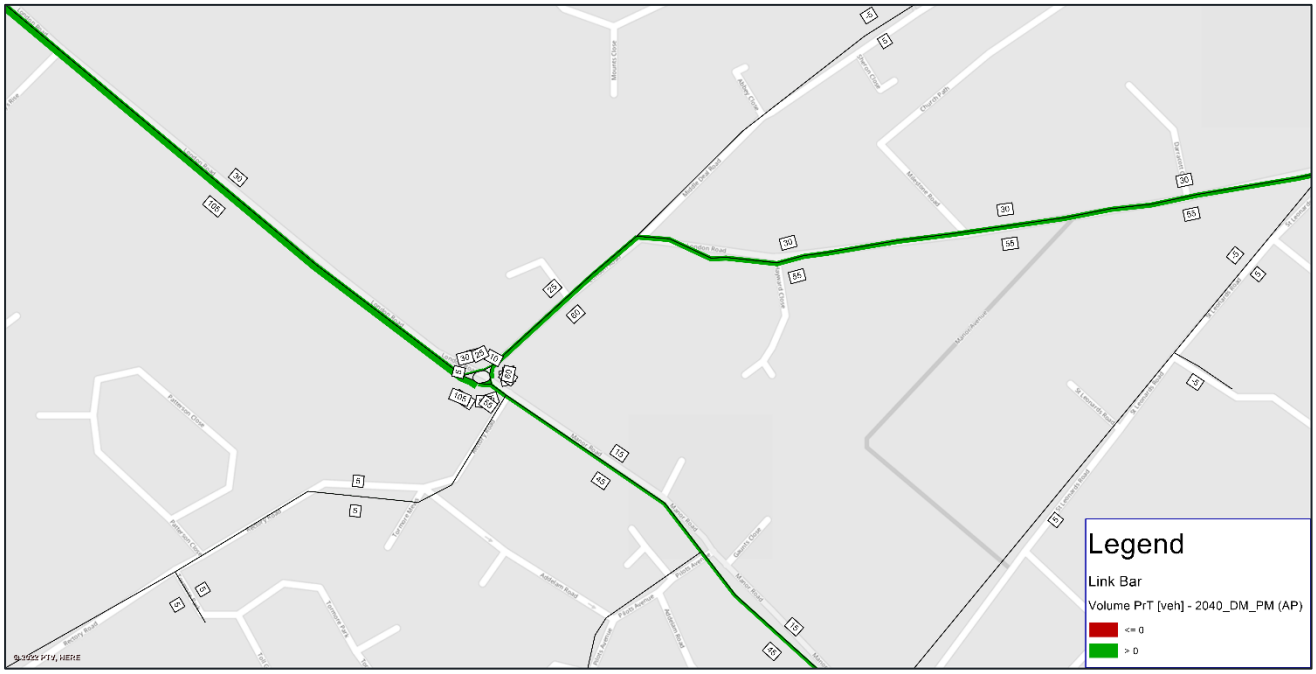


Figure 6-70: DDTM 2040 Do Something 1 with Mitigation - 2040 Do Minimum Actual Difference, London Road, PM Peak

6.7.25. Figure 6-71 presents the percentage flow differences for the London Road roundabout in the PM peak; all arms show an increase in flow of between 5 – 15%. The largest increases are observed on the Manor Road approach with increases of 15%.

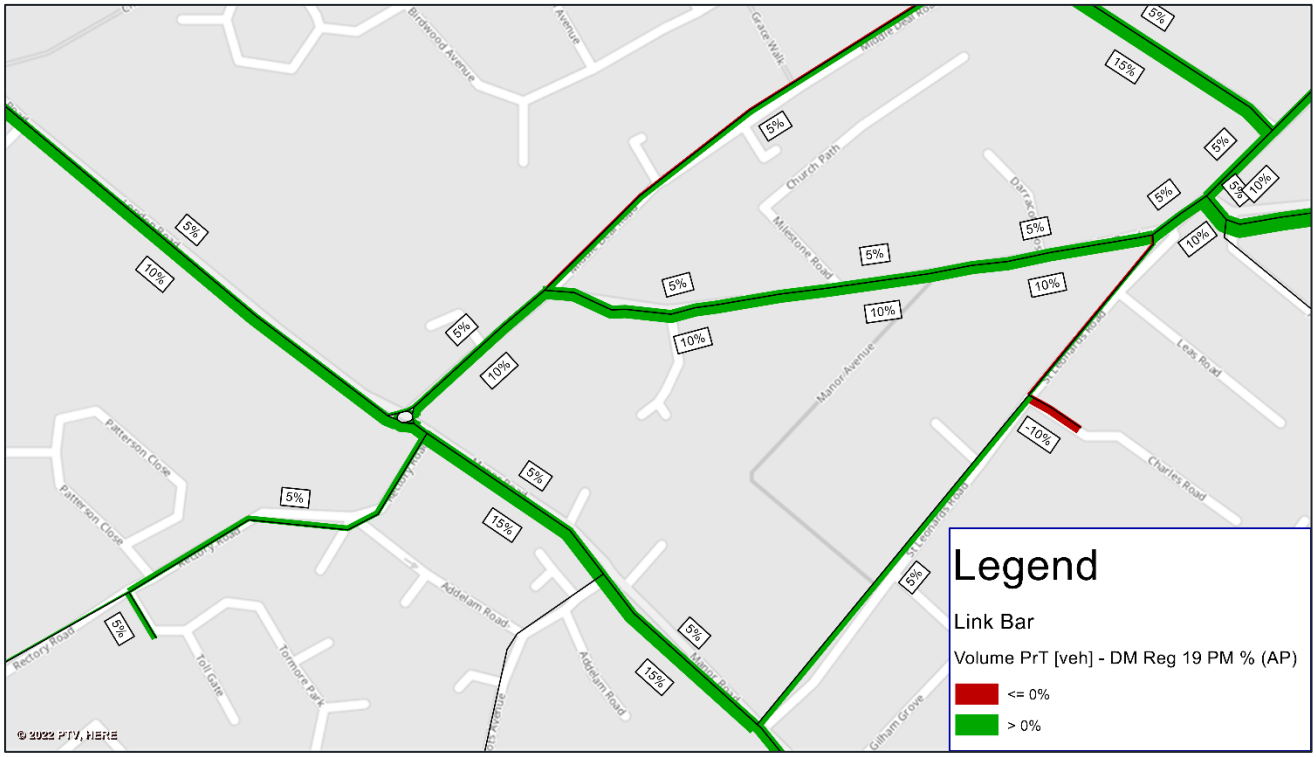


Figure 6-71: DDTM 2040 Do Something 1 with Mitigation - 2040 Do Minimum % Difference, London Road Roundabout, PM Peak

6.7.26. Figure 6-72 highlights the actual flow difference at the A256/Deal Road Roundabout in Deal for the AM peak; the figure shows that there are slight changes in overall flows; an increase of an average 11 vehicles on A256 South and a decrease of an average 40 flows travelling on Deal Road.

6.7.27. It is noted that in the Do Minimum scenario, this junction is already shown to have queuing on all approaches, any additional demand included within the Do Something further exacerbates this, making the junction appear extremely unattractive. The junction itself lies outside of the DDTM study area and so whilst it is useful to present changes in flow at this location, any impacts are caveated given this area was not within the base year validation or calibration process.

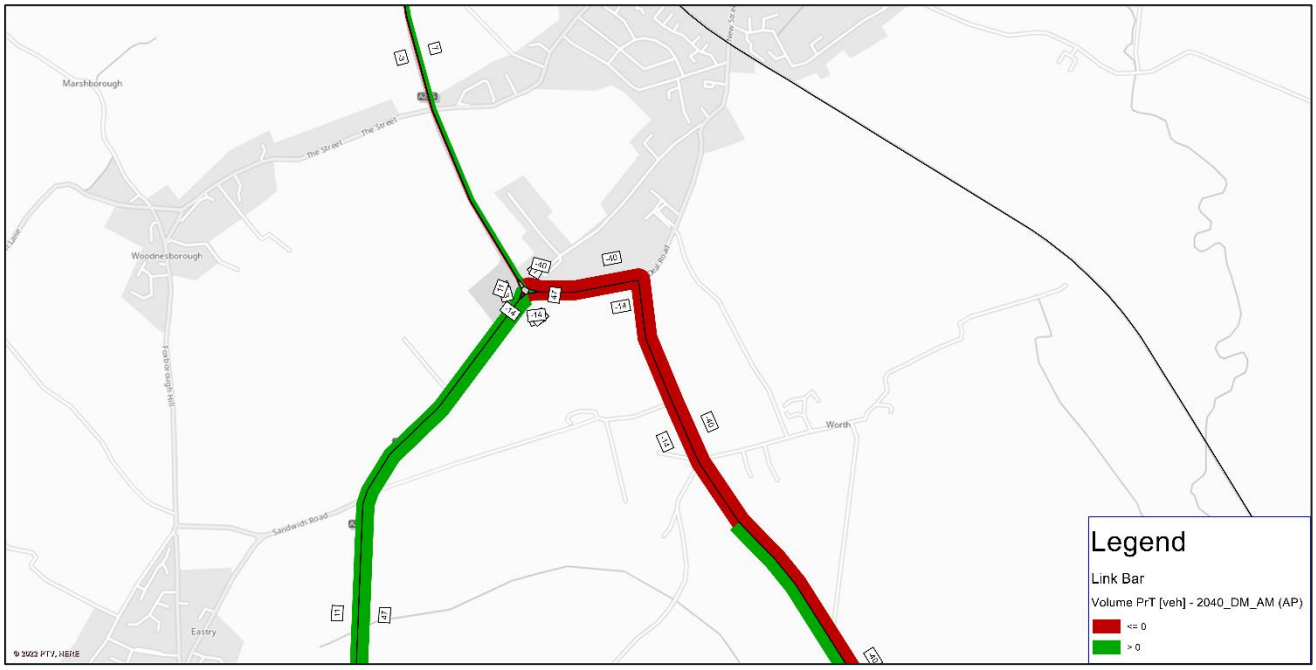


Figure 6-72: DDTM 2040 Do Something 1 with Mitigation - 2040 Do Minimum Actual Difference, A256/ Deal Road, AM Peak

6.7.28. Figure 6-73 presents the percentage flow change at the A256/ Deal Road roundabout in the AM peak, all differences are negligible, 5% or less. In this scenario, the junction is shown to operate over capacity in the Do Minimum and there is very little increase in flow in DS2 at this location.

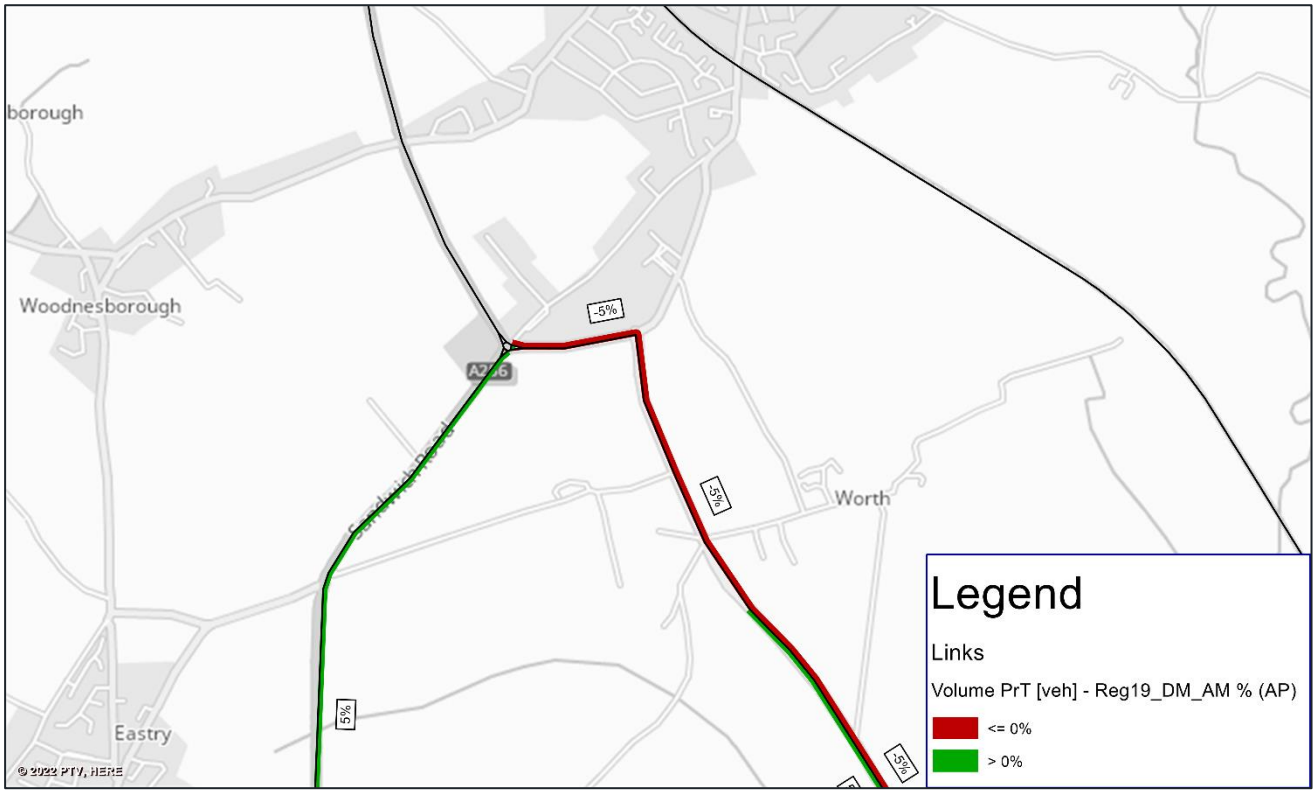


Figure 6-73: DDTM 2040 Do Something 1 with Mitigation - 2040 Do Minimum % Difference, A256/ Deal Road, AM Peak

6.7.29. Figure 6-74 presents the actual flow differences for the A256/ Deal Road roundabout in the PM Peak; there is an increase in flows on all approach varying between 5 – 140 vehicles. This demonstrates a very different picture than the AM Peak; this junction experiencing significantly less queueing in the PM Do Minimum model and as such when adding trip generation from Local Plan allocations, there is still considered to be capacity at this junction and therefore flow increases are more prominent in the PM peak.

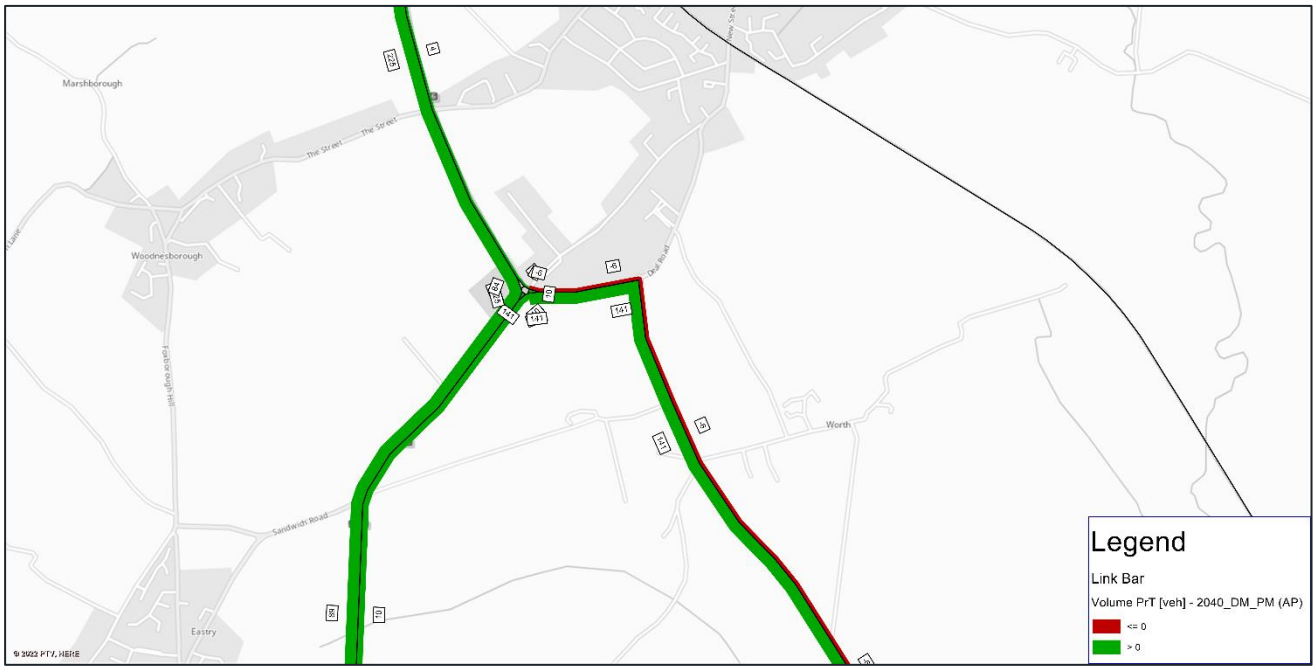


Figure 6-74: DDTM 2040 Do Something 1 with Mitigation - 2040 Do Minimum Flow Difference, A256/ Deal Road, PM Peak

6.7.30. Figure 6-75 presents the actual flow percentage difference for the A256/ Deal Road roundabout in the PM Peak; all approaches are noted to have a 10% - 20% increase in flows, whereas the exit arms have a negligible difference.

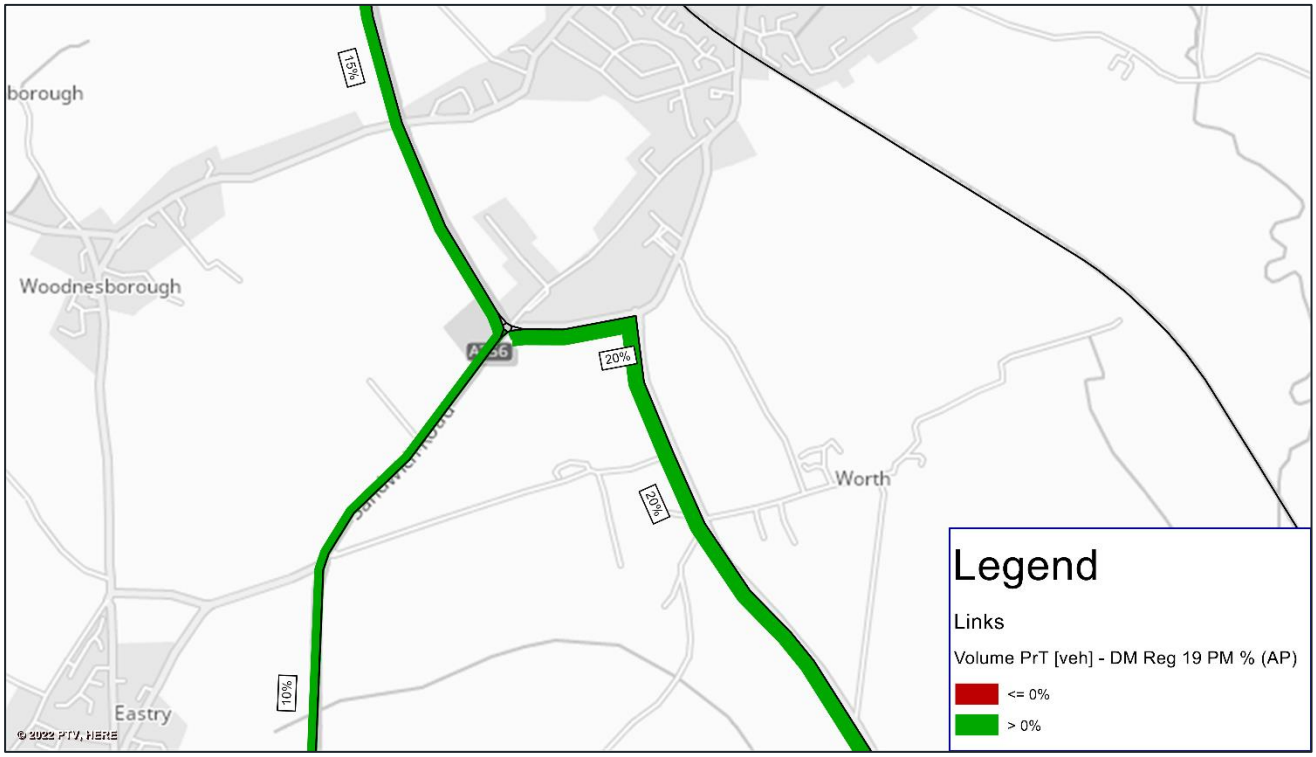


Figure 6-75: DDTM 2040 Do Something 1 with Mitigation - 2040 Do Minimum % Difference, A256/ Deal Road, PM Peak

6.8 Do Something 1 with Mitigation, Volume over Capacity Assessment

6.8.1. A volume over capacity assessment has been undertaken to determine and classify the impact on links and nodes within the 2040 Do Something scenario, as a result of incorporating the Regulation 19 site allocations. The assessment will help to identify possible links and nodes which are likely to experience capacity issues or be approaching capacity constraints when the Local Plan sites are included; it will be useful in monitoring the operation of links and nodes which are already shown to be approaching capacity in the 2040 Do Minimum and help to identify any additional areas for monitoring or mitigation.

6.8.2. The description of the threshold used to undertake the analysis are presented in Table 6-12, earlier in this chapter.

6.8.3. Figure 6-76 and Figure 6-77 show the V/C impacts on links and nodes within the full extent of the DDTM 2040 Do Something model area in the AM and PM peak respectively; the impacts on a localised level within Dover and Deal are discussed later within this chapter.

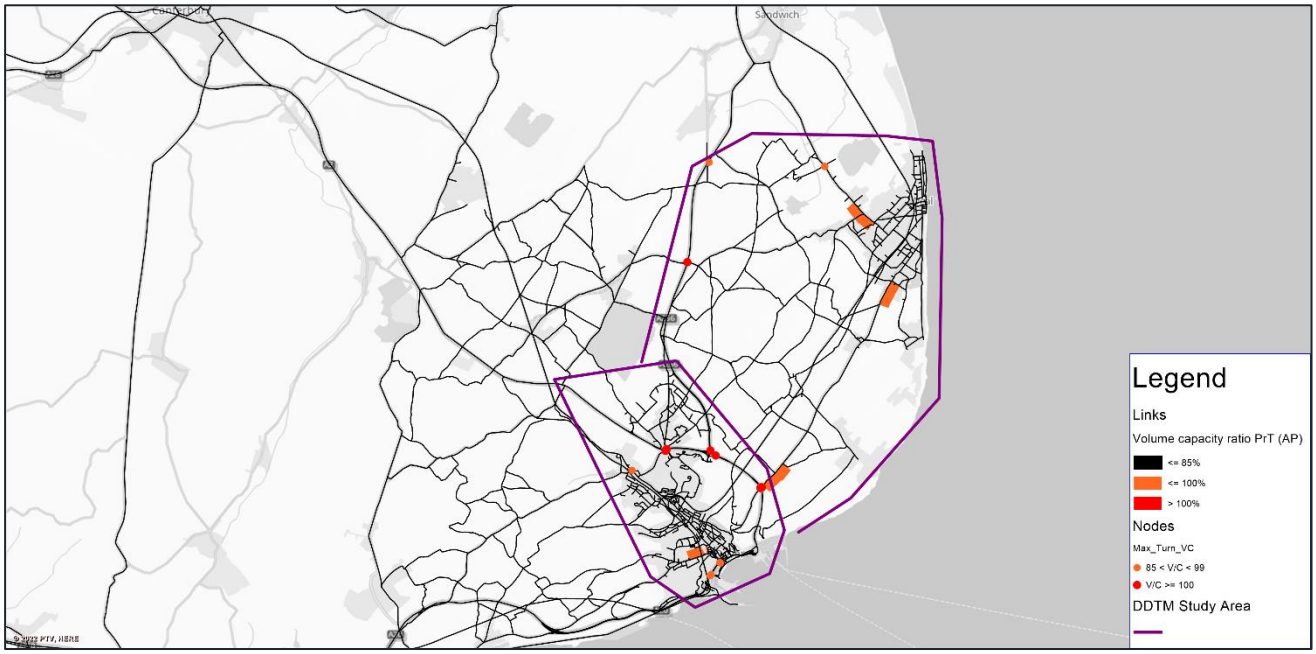


Figure 6-76: DDTM 2040 Do Something 1 with Mitigation, V/C Assessment, Full Model Extent, AM Peak



Figure 6-77: DDTM 2040 Do Something 1 with Mitigation, V/C Assessment, Full Model Extent, PM Peak

6.8.4. Figure 6-78 presents the V/C assessments on links and nodes within the Dover area in the AM peak categorised using the thresholds summarised in Table 6-12, with Figure 6-79 presenting a more detailed close-up of Whitfield roundabout, the A256/A2 grade-separated junction and the Duke of York roundabout. All approaches on the Whitfield Roundabout and Duke of York Roundabout approaches operate close to or over capacity (over 85%). However, it is important to note that the flows at these junctions have been assessed in detailed junction models using TRANSYT and the resulting performance has been agreed with KCC and NH, see Chapter 8.

6.8.5. The Folkstone Road link is operating close to capacity (85%-100%) in the Eastbound direction; in the Do Minimum model this road nears capacity (75%-85%), and thus the increase in V/C in the location is likely as a result of the Local Plan developments routing along this link to access/egress Dover town centre.

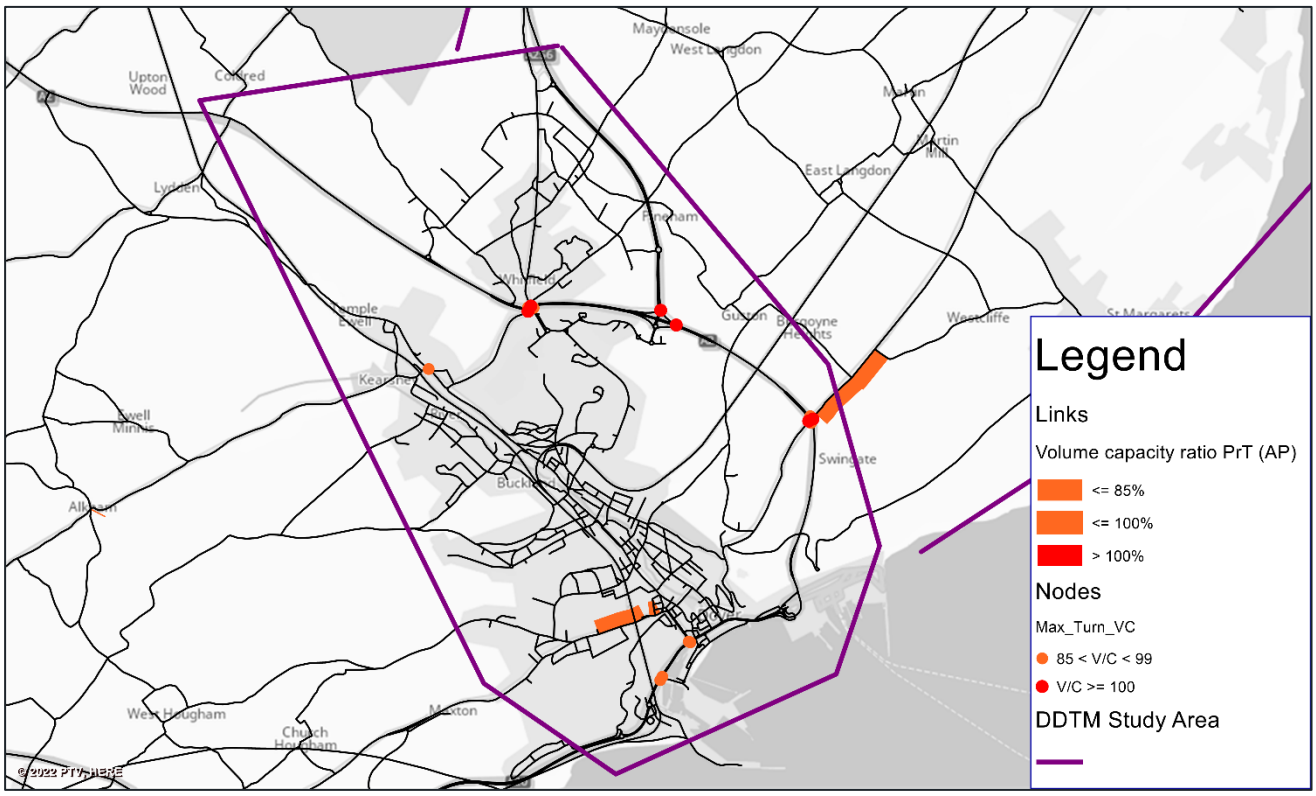


Figure 6-78: DDTM 2040 Do Something 1 with Mitigation, V/C Assessment, Dover, AM Peak

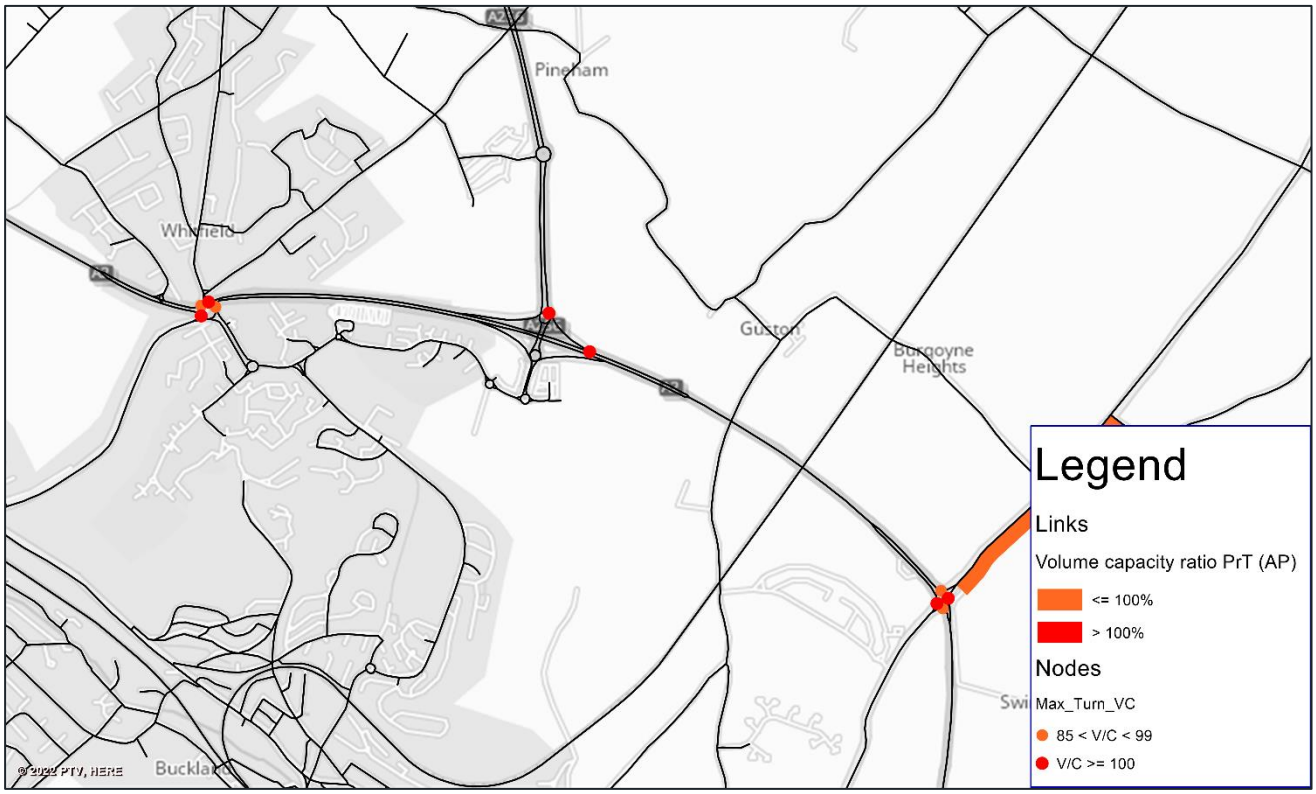


Figure 6-79: DDTM 2040 Do Something 1 with Mitigation, V/C Assessment, Dover Key Junctions, AM Peak

6.8.6. Figure 6-79 demonstrates that both A2 eastbound and westbound, Whitfield Hill and Sandwich Road approaches to Whitfield roundabout continue to operate close to (85-100%), or exceeding (100%+), capacity in the 2040 Do Something 1 AM Peak. Similarly, all four approaches to the Duke of York roundabout are also operating at above 85% V/C. This trend is similar to that presented in the Do Minimum scenario. However, it is important to note that the flows at these junctions have been assessed in detailed junction models using TRANSYT and the resulting performance has been agreed with KCC and NH, see Chapter 8.

6.8.7. Whilst the A256 southbound approach to the A2/A256 junction nears capacity (85%), in the Do Minimum scenario, this approach exceeds capacity (114%) in the DS1 scenario, suggesting that the Local Plan sites in the locality will result in the junction deterioration. WSP have undertaken detailed junction modelling of this junction using flows from DDTM and these suggest the junction operates within acceptable levels of capacity and delays and this has been agreed with NH and KCC. A merge/ diverge assessment has also been undertaken using the DS1 flows and the merge in this locality operates well within capacity. White Cliffs Business Park proposed to attract a significant number of employment trips in the AM Peak; a significant number of residential Whitfield Urban Expansion trips also egress the development via the A256 junction in the AM peak. The combination of these potential site allocations within the immediate proximity of the A256/A2 grade separated junction is likely to account for the increases in delay and V/C exceeding 100.

6.8.8. For the PM Peak, Figure 6-80 presents the V/C assessments on links and nodes within the Dover area and Figure 6-81 presents a more detailed close-up of Whitfield roundabout, the A256/A2 grade-separated junction and the Duke of York roundabout.

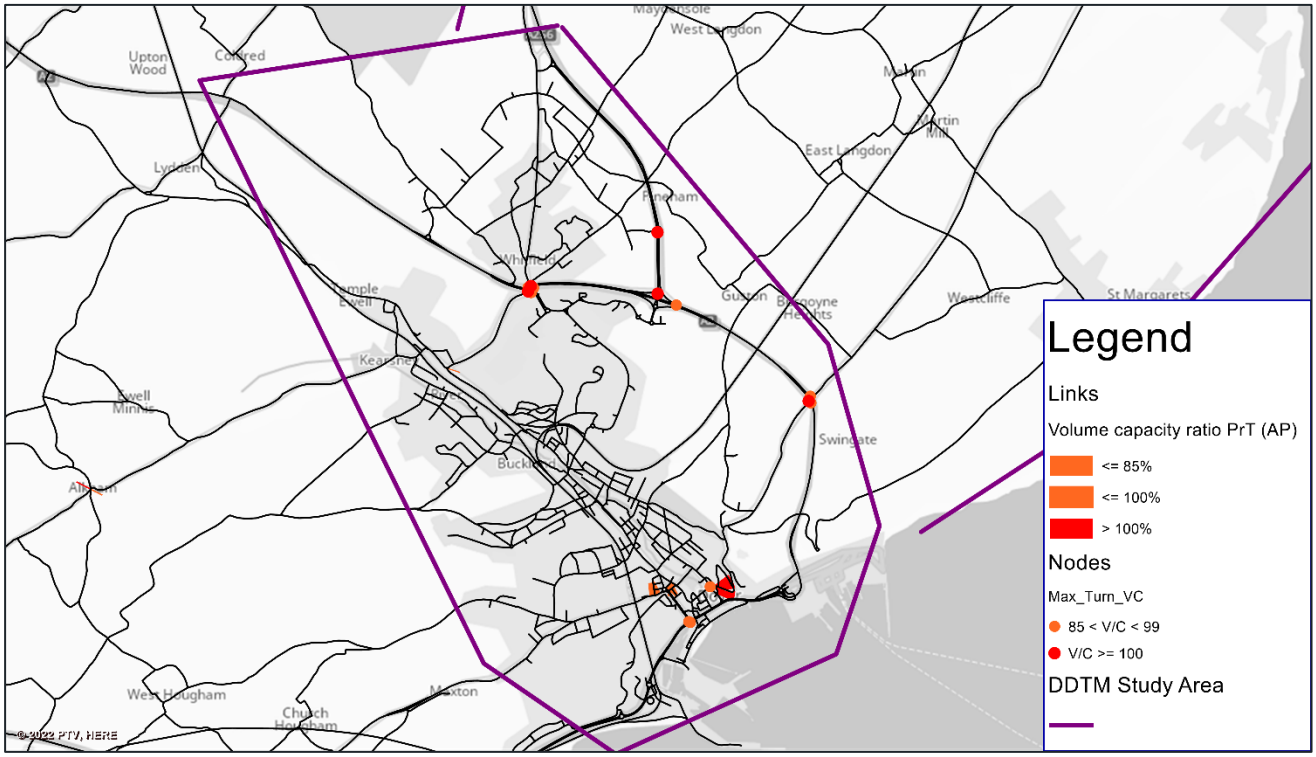


Figure 6-80: DDTM 2040 Do Something 1 with Mitigation, V/C Assessment, Dover, PM Peak

6.8.9. Generally speaking, the PM peak in the Do Something 1 scenario presents broadly consistent patterns with the Do Minimum scenario; Figure 6-81 highlights that all approaches at the Whitfield Roundabout (except for Honeywood Parkway) are near or over capacity. It is important to note that the flows at these junctions have been assessed in detailed junction models using TRANSYT and the resulting performance has been agreed with KCC and NH, see Chapter 8.

6.8.10. In the PM peak, the departure of trips from the White Cliffs Business Park are seen to directly impact operation at the A2/A256 junction with the northbound junction shown to be over capacity.

6.8.11. Figure 6-81 demonstrates similar trends to the Do Minimum for the Duke of York, A256 and Whitfield roundabout. The Duke of York has a turn V/C exceeding 85% at on all approaches in the PM peak. The A256 / Whitfield Phase 1/1A roundabout is also shown to exceed capacity on the A256 NB approach this is due to increased demand at this junction as a result of the delivery of housing at Whitfield and White Cliffs Business Park employment.



Figure 6-81: DDTM 2040 Do Something 1 with Mitigation, V/C Assessment, Dover Key Junctions, PM Peak

6.8.12. V/C analysis within Dover for the AM and PM peak hours within the 2040 DS1 has demonstrated that the Whitfield and Duke of York roundabouts are forecast to operate near capacity on all approaches (greater than 85% V/C) with the implementation of the junction mitigations. However, it is important to note that the flows at these junctions have been assessed in detailed junction models using TRANSYT and the resulting performance has been agreed with KCC and NH, see Chapter 8.

6.8.13. Figure 6-82 presents the V/C assessments on links and nodes within Deal in the AM peak.



Figure 6-82: DDTM 2040 Do Something 1 with Mitigation, V/C Assessment, Deal, AM Peak

6.8.14. The V/C assessment within Deal demonstrates less significant capacity constraints when compared with Dover however a link V/C over 85% is evident northbound on the A258 away from the London Road / Manor Road junction. As this link approaches the Betteshanger Road roundabout, a maximum turn V/C of over 85% is also shown.

6.8.15. Figure 6-83 presents the V/C assessments on links and nodes within Deal in the PM Peak; it shows that the majority of links and nodes within Deal operate with a V/C less than 85%, with the exception of A258 London Road through Walmer which operates between 85%-100%.



Figure 6-83: DDTM 2040 Do Something 1 with Mitigation, V/C Assessment, Deal, PM Peak

6.8.16. The V/C assessment has been undertaken on the 2040 DS1 to determine which links and junctions were over capacity as a result of the additional demand generated by the potential site allocations. The assessment has demonstrated that Whitfield roundabout and Duke of York roundabout are forecast to operate over capacity, however TRANSYT modelling has been undertaken using the VISUM flows and highlighted that the junction performance is within capacity and this has been agreed with KCC and NH. It is important to note that the Whitfield mitigation scheme is to provide nil detriment between DM and DS scenarios, as it does provide an improvement on the DM operations and mitigated the Local Plan growth. See chapter 8 for more details.

6.8.17. In addition, the combination of the Whitfield Urban Expansion and the large employment site at White Cliffs Business Park places additional pressure on the strategic network and the tidal movements are shown to impact the V/C level at the A2/A256 grade separated junction in the AM and PM peak. It is important to note that there is an element of double counting of new trips assumed at Whitfield and White Cliffs Business Park as we have not assumed a trip reduction at the sites to take into account the trips of people who will live at Whitfield and work at White Cliffs Business Park. Both junction modelling and merge and diverge

assessments have been undertaken at the junction which demonstrate it operates within capacity, with the exception of the Honeywood Parkway arm in the PM peak as a result of those leaving White Cliffs Business Park.

6.8.18. Table 6-10 details the changes in V/C at key links and nodes identified within Do Minimum and Do Something 1 models as approaching or being over capacity in the AM or/ and PM Peaks. If there is an exceedance of 85% the text is coloured orange, if the performance is over 100% the text is coloured red.

Table 6-14: V/C Links and Nodes Summary, Do Something 1 with Mitigation vs Do Minimum

Network Location within DDTM Study Area		Do Minimum		Do Something 1	
		AM Peak	PM Peak	AM Peak	PM Peak
Link	A256 Whitfield Hill / London Road roundabout	77	88	78	82
	A256 Whitfield Hill roundabout/ London Rd roundabout; Circulatory Arm	58	84	61	91
	A258 Deal Road Southbound; Approach to DoY, north of The Lane	74	48	98	50
	A258 Northbound, North of Church Street Junction to Granville/ Salisbury Road	63	74	73	86
	A258 London Road, North of Mongeham Way Junction	90	65	92	72
	A258 London Road Northbound, between The Street and Sholden New Road	88	63	90	70
	A258 London Road Northbound	95	61	95	68
	A258 London Road/ Manor Road Roundabout; Circulatory Arm	108	72	109	80
	A258 London Road/ Manor Road Roundabout; Circulatory Arm	94	74	95	79
	Northern part of London Road / Manor Road roundabout	81	86	84	88
	Castle Hill Road/ St James Street SB	75	114	72	125
	Dover Road Southbound, South of Hawksdown Junction	72	45	91	48
	Biggin Street Westbound between Worthington Street and Priory Street	69	74	82	92
	Priory Street Southbound - Towards roundabout	61	69	74	87
	Folkestone Rd Eastbound - Approaching A256 York St/ Priory Road roundabout	81	83	87	92
Node	Whitfield Roundabout, A2 West Approach	94	98	96	93
	Whitfield Roundabout, Whitfield Hill Approach	99	100	103	105
	Whitfield Roundabout, Sandwich Road Approach	103	103	116	102
	Whitfield Roundabout, A2 East Approach	100	87	91	96
	Whitfield Roundabout, Honeywood Road Approach	85	89	82	94
	Duke of York roundabout - A2 West Approach	105	101	95	98
	Duke of York roundabout - A2 Jubilee Way Approach	90	99	91	95
	Duke of York roundabout - A258 Deal Road North Approach	105	68	99	61
	Duke of York roundabout - A258 Deal Road South Approach	84	105	101	109
	A256 / A2 Northern Roundabout; Northbound Approach	39	60	52	100
	A256 / A2 Northern Roundabout; Southbound approach	85	50	114	74
	A2 Eastbound onslip from A256/ A2 Northern roundabout	72	55	110	85
	A265/ Richmond Way Roundabout, A256 Northbound Approach	45	77	59	106
	A20 Limekiln Street/ Union Street Signalised junction	88	74	91	72
	A20 Limekiln Street/ Snargate Street /Union Street Signalised Junction	84	70	86	69
	Castle Street/ MaisonDieu Road Signalised junction	82	95	81	85
	A20 Snargate St/ York St Signalised Junction	70	78	85	89
	A20 Snargate St/ York St Signalised Junction	74	81	89	93
	London Road / Alkham Valley Road Junction	59	61	86	61
	Dover Road/ Boys Hill Roundabout, A256 North Approach	95	62	107	63
	A256 Dover Road/ Dover Road Roundabout, A256 Dover Road NE Approach	75	46	86	49

6.8.19. Summary tables and flow difference plots have demonstrated increases in vehicle volumes at Whitfield Roundabout, the A2/A256 grade-separated junction and the Duke of York roundabout in both the Do Minimum and Do Something scenarios. The strategic models have indicated the increased flow at the A256/ A2 interchange and London Road/ Alkham Valley Road junction could trigger volume over capacity constraints at these junctions and lead to significant re-routing away from these areas. Detailed junction models and the results at these junctions are presented in Chapter 8.

6.9 Do Something 2 with Mitigation vs Do Minimum

6.9.1. Analysis has also been undertaken to understand the impact of an additional 2,930 dwellings at Whitfield Urban Expansion. The same network has been assumed for the two DS scenarios with mitigation and as such the only difference is the total trips input into the model.

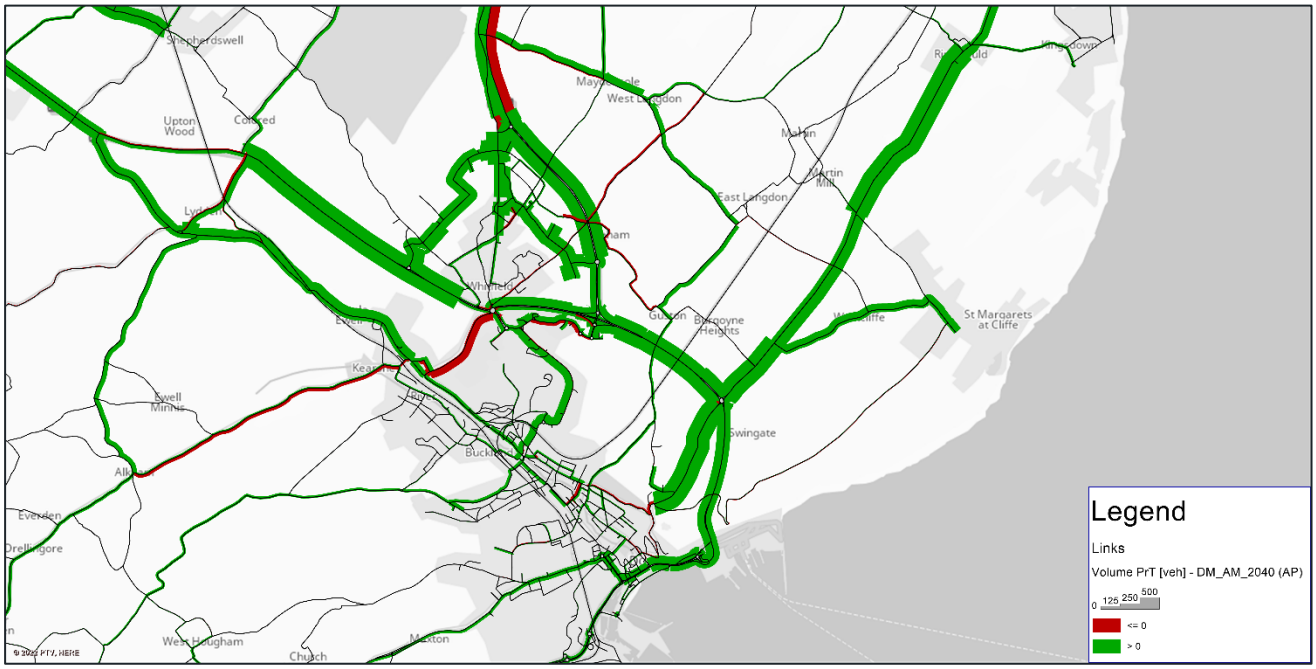


Figure 6-84: DDTM 2040 Do Something 2 with Mitigation- Do Minimum Flow Difference, Dover, AM Peak

6.9.2. Detailed investigation into the AM flow differences presented in Figure 6-84, and the subsequent re-routing of vehicles as a result of implementing the potential Local Plan allocations and junction improvements. As a result of the Duke of York junction improvements there are increases in traffic demand along the A258 and reductions in traffic on some of the local roads between the A256 and A258. This indicates that the Duke of York junction improvement encourages traffic to use the strategic road network instead of local roads. There are some flow reductions around Whitfield roundabout which is a result of the signalisation of the roundabout. Detailed TRANSYT modelling of both Duke of York and Whitfield roundabouts using traffic flows from the VISUM models has been undertaken and agreed with NH and KCC as discussed in Chapter 8 and Appendix A and B, in separate document. There are increases in traffic on the proposed Whitfield development highway network noting these are greater in DS2 compared to DS1 as a result of the higher number of dwellings assumed in Whitfield in DS2.

6.9.3. White Cliffs Business Park is a significant trip attractor in the AM Peak, due to the large provision of jobs at this site, and some vehicles access via the A2 / A256 grade separated junction.

6.9.4. Figure 6-85 presents the actual flow difference between the 2040 Do Something 2 and 2040 Do Minimum in Dover in the PM Peak. Similar to the AM Peak, that these figures do not include labels and have instead been presented to show the broad patterns in flow increase / decrease and on which roads these occur.

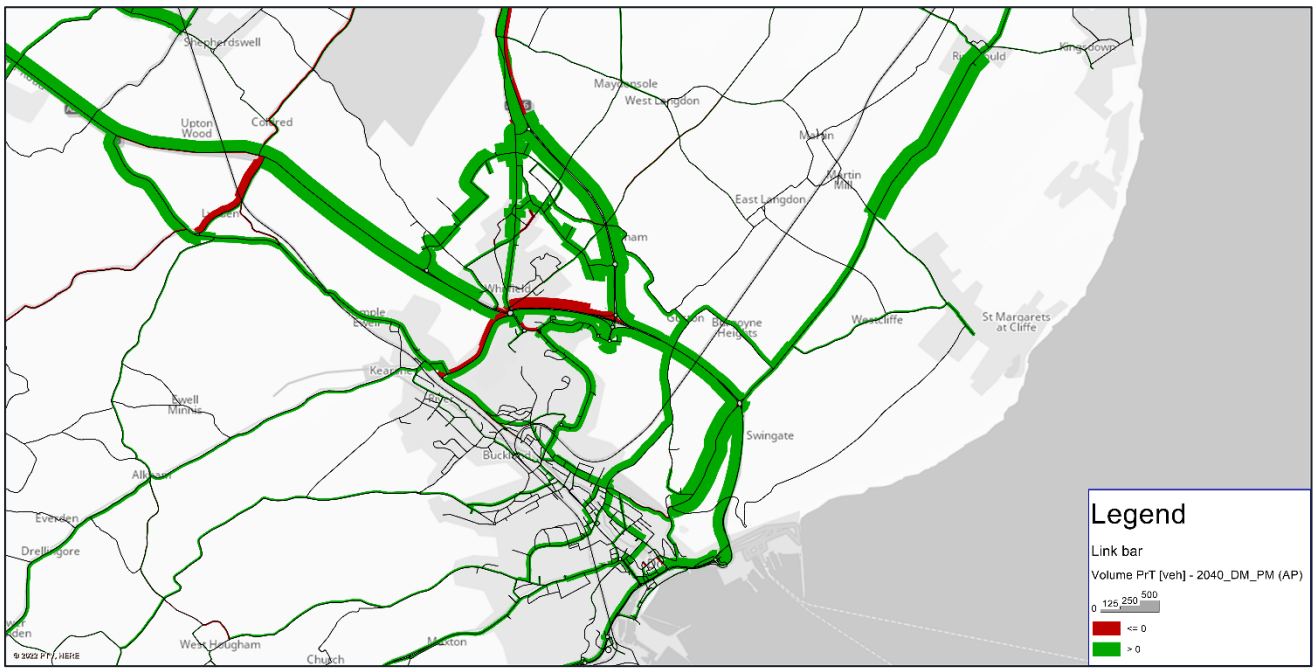


Figure 6-85: DDTM 2040 Do Something 2 with Mitigation- Do Minimum Flow Difference, Dover, PM Peak

6.9.5. There are increases presented on the A2 approaches to the Duke of York roundabout, this is as a result of the mitigations at this junction alongside the additional local plan growth in this area. Increased flow is also seen to route on the A256 in both directions between the A2/a256 interchange and the new development junction. Increases of flow are seen on the Whitfield development road.

6.9.6. Figure 6-85 shows increased flow on London Road westbound of approximately 130 vehicles with reductions of similar magnitude on Whitfield Hill.

6.9.7. Figure 6-86 and Figure 6-87 present the actual flow difference between the 2040 Do Something 2 and the 2040 Do Minimum in Deal in the AM Peak and PM Peak respectively. Generally, the Deal area shows less significant increases and decreases in vehicle volumes, compared with Dover, as a result of including the potential Local Plan development allocations.

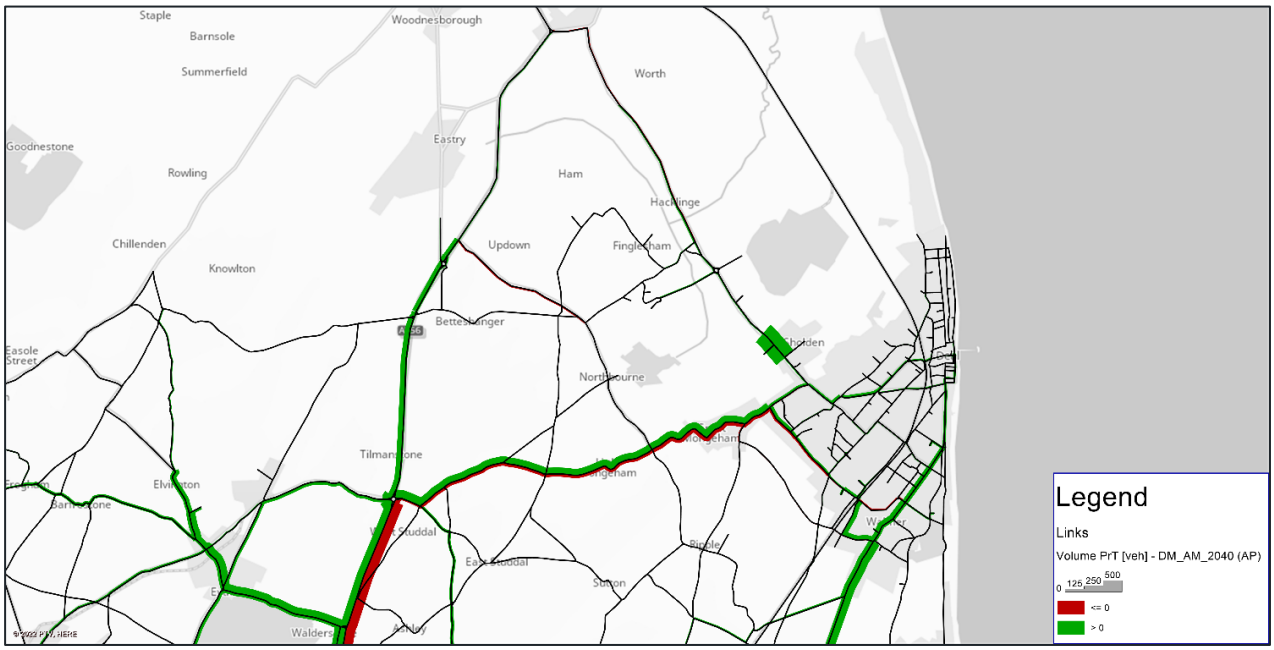


Figure 6-86: DDTM 2040 Do Something 2 with Mitigation - 2040 Do Minimum, Deal, AM Peak



Figure 6-87: DDTM 2040 Do Something 2 with Mitigation - 2040 Do Minimum, Deal, PM Peak

6.9.8. Junctions of interest were assessed using the actual flow and percentage flow difference as a point of comparison to demonstrate the arms with increases and decreases for the DS2 scenario. This allowed the impacts of the Dover Local Plan sites with the additional 2,930 dwellings assumed at Whitfield Urban Expansion modelled in 2040 Do Something scenario to be compared against the 2040 Do Minimum scenario.

6.9.9. Figure 6-88 presents the actual flow change at Whitfield Roundabout in the AM peak; there are reductions of flows on the A2 eastbound and Whitfield Hill of 70 flows and Sandwich Road of 10. Increases are presented on the A2 westbound of 155 and Honeywood Park Road. Details on the changes in flows as a result of no mitigation is detailed in section 6.11.

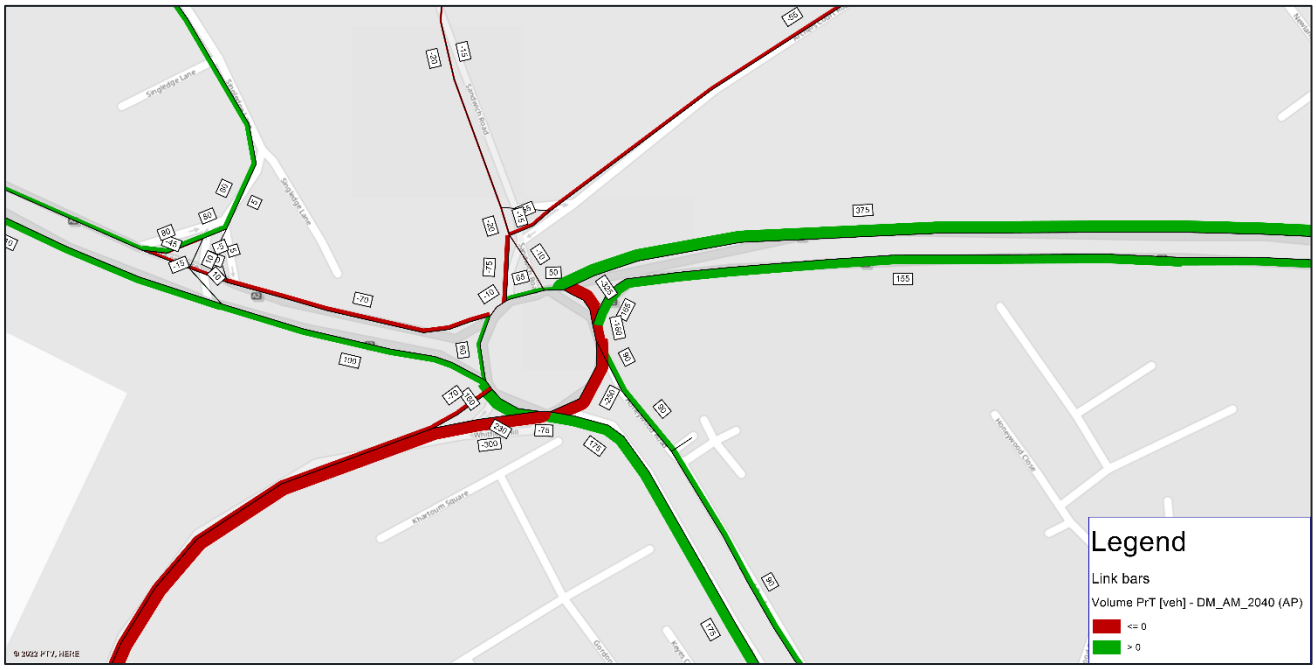


Figure 6-88: DDTM 2040 Do Something 2 with Mitigation - 2040 Do Minimum Flow Difference, Whitfield Roundabout, AM Peak

6.9.10. Figure 6-89 shows the percentage flow changes at the Whitfield roundabout in the AM peak; flows on the A2 eastbound, Sandwich Road and Whitfield Hill approach to the junction decrease by 5-15%, an increase on the A2 eastbound main route is shown to be an average of 35% - given the growth period of 25 years, this is approximately 1.4% increase per annum.

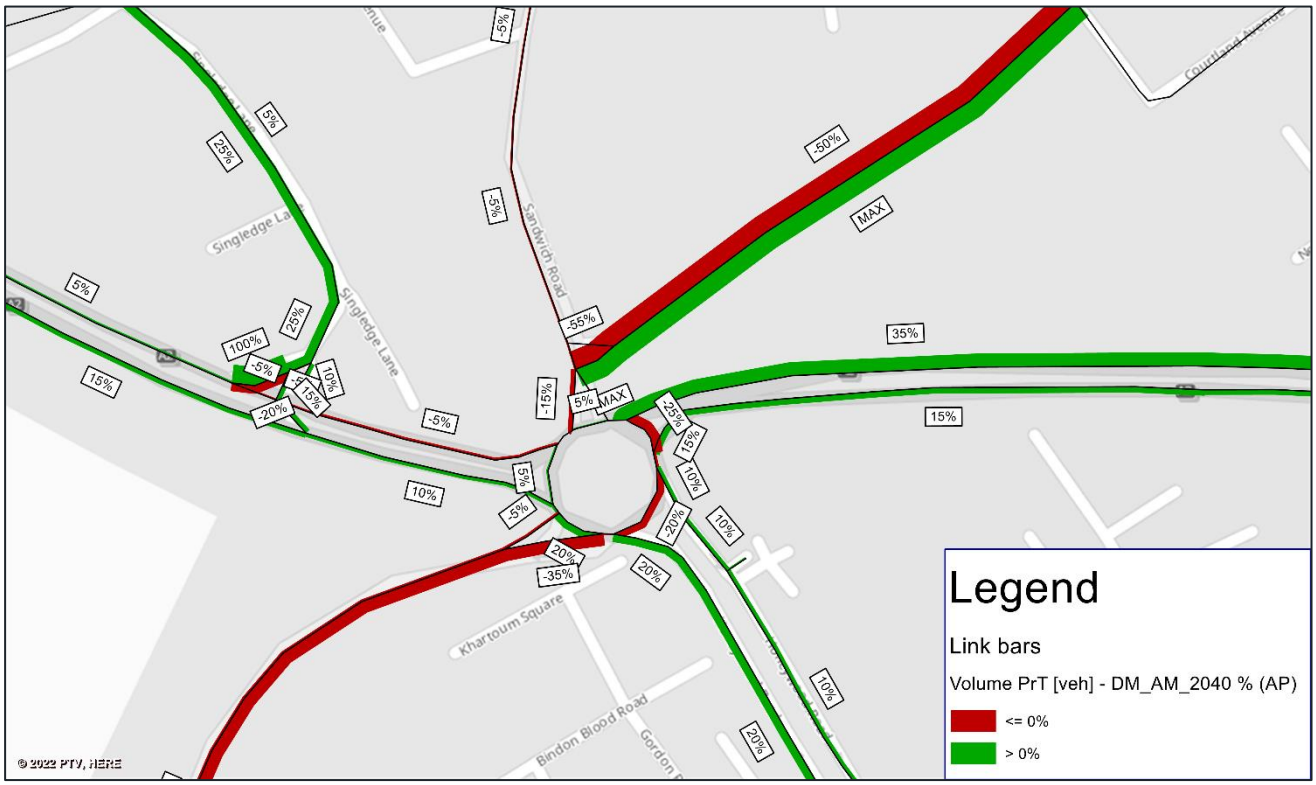


Figure 6-89: DDTM 2040 Do Something 2 with Mitigation - 2040 Do Minimum % Difference, Whitfield Roundabout, AM Peak

6.9.11. Figure 6-90 shows the actual flow increases at the Whitfield Roundabout in the PM Peak; flows along the A2 westbound increase by approximately 345, however a decrease of 445 vehicles using the A2 Eastbound is evident. There is an increase of 90 flows approaching from Honeywood Parkway, due to the WCBP.

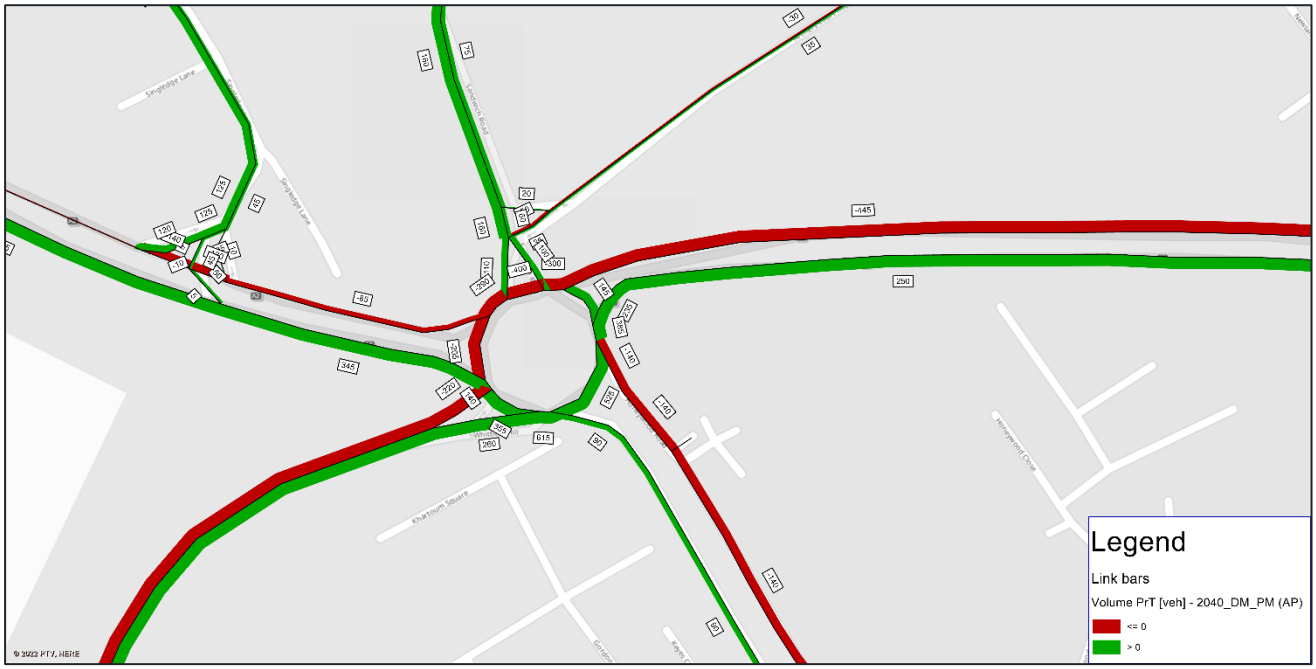


Figure 6-90: DDTM 2040 Do Something 2 with Mitigation - 2040 Do Minimum Flow Difference, Whitfield Roundabout, PM Peak

6.9.12. Figure 6-91 presents the percentage flow difference at the Whitfield Roundabout in the PM Peak and demonstrates an average increase of approximately 45% travelling northbound on Sandwich Road. A reduction of flows on the A2 Eastbound ranges between 10% - 35%.

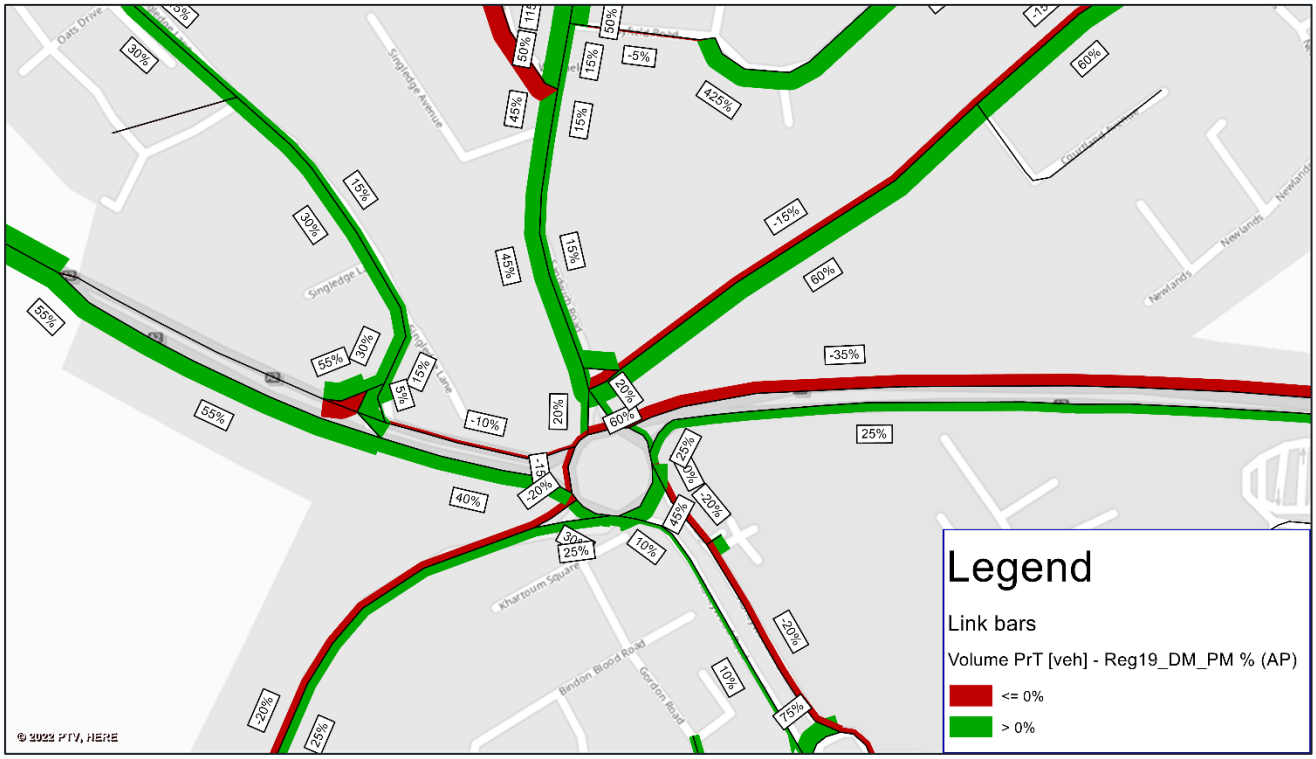


Figure 6-91: DDTM 2040 Do Something 2 with Mitigation - 2040 Do Minimum % Difference, Whitfield Roundabout, PM Peak

6.9.13. Figure 6-92 presents the actual flow increases at the Duke of York roundabout in the AM Peak. It is noted that flow differences have not been presented for the A258 south of the roundabout as this link does not have consistent numbering between DM and DS scenarios.

6.9.14. Increases in vehicle volumes westbound along the A2 are accredited to employment trips going to the White Cliffs Business Park at the A256/A2 junction to the west, and residential trips leaving the nearby Connaught Barracks site.

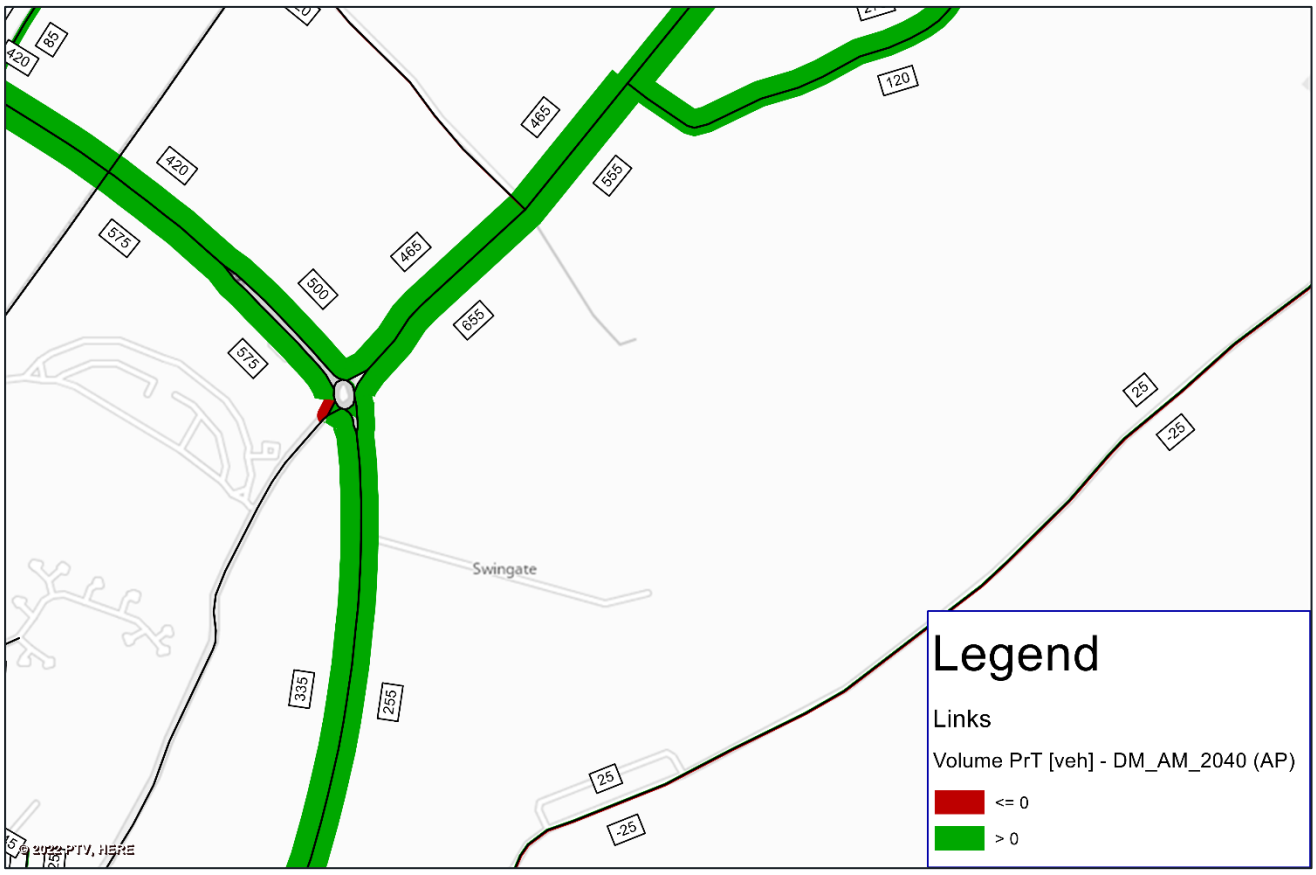


Figure 6-92: DDTM 2040 Do Something 2 with Mitigation - 2040 Do Minimum Actual Difference, DoY Roundabout, AM Peak

6.9.15. Figure 6-93 shows the percentage flow change at the Duke of York Roundabout in the AM peak; all approaches have increases of 35%, 60% and 55%, on the A2 west, A258 southbound and A2 Jubilee Way approaches.

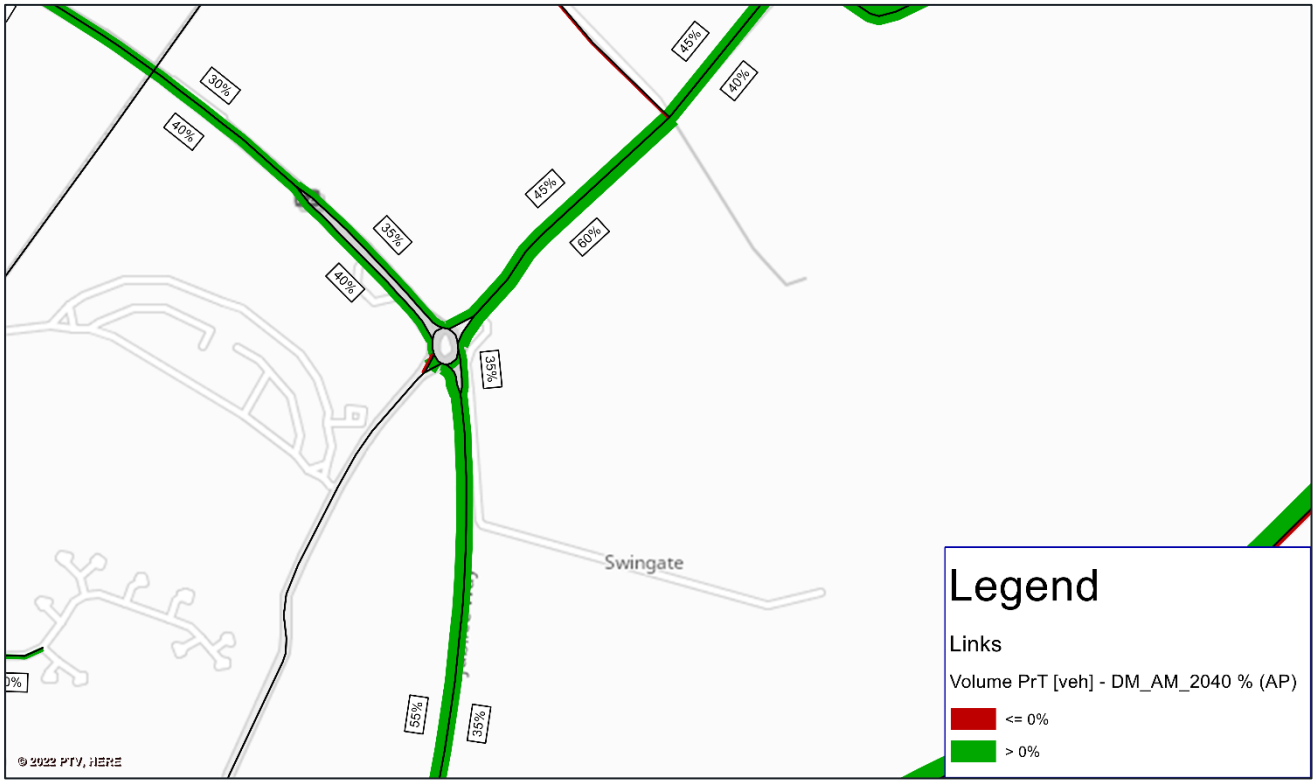


Figure 6-93: DDTM 2040 Do Something 2 with Mitigation - 2040 Do Minimum % Difference, DoY Roundabout, AM Peak

6.9.16. Figure 6-94 presents the actual flow differences at the Duke of York roundabout in the PM peak; this highlights a substantial increase of flows on most entry and exit arms, this is likely due to the mitigation at the junction attracting vehicles back onto mainline traffic routes.

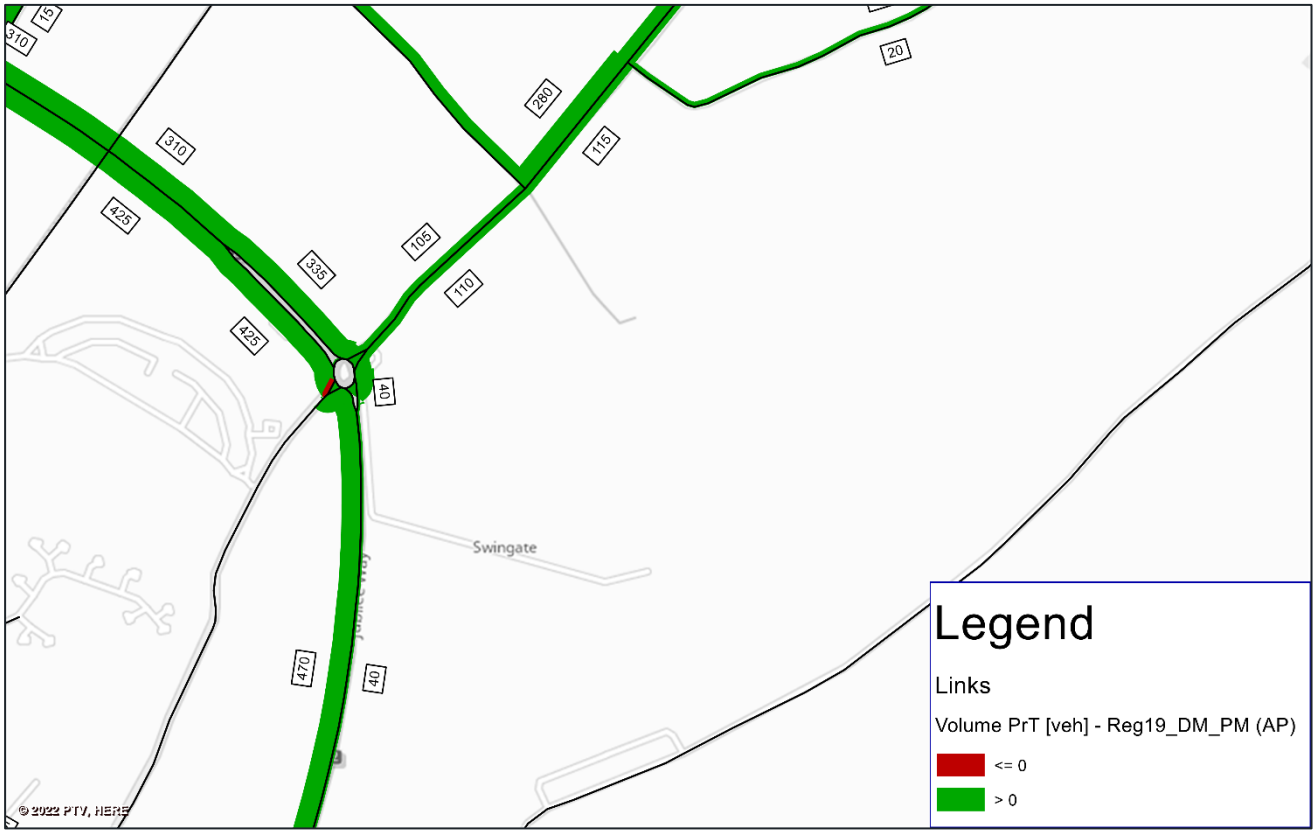


Figure 6-94: DDTM 2040 Do Something 2 with Mitigation - 2040 Do Minimum Actual Difference, DoY Roundabout, PM Peak

6.9.17. Figure 6-95 shows the percentage flow changes at the Duke of York roundabout in the PM peak; there are increases of a slightly smaller magnitude compared with the AM peak. There are increases of 65% observed on the A2 Jubilee Way with traffic on this approach routing to residential areas in Deal, Ash and Canterbury.

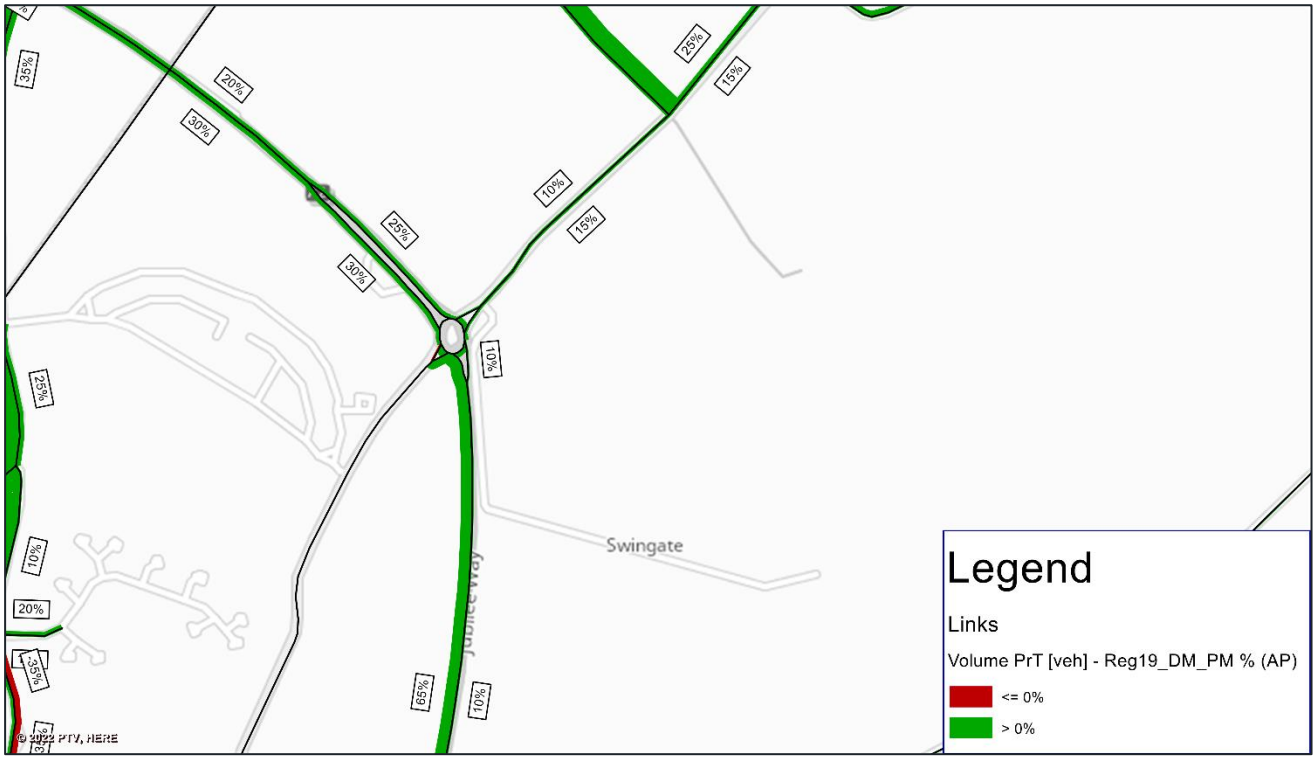


Figure 6-95: DDTM 2040 Do Something 2 with Mitigation - 2040 Do Minimum % Difference, DoY Roundabout, PM Peak

6.9.18. Figure 6-96 presents the actual flow differences at the London Road/ Manor Road roundabout in Deal in the AM peak. All approach arms present increases between 20 – 125 vehicles.

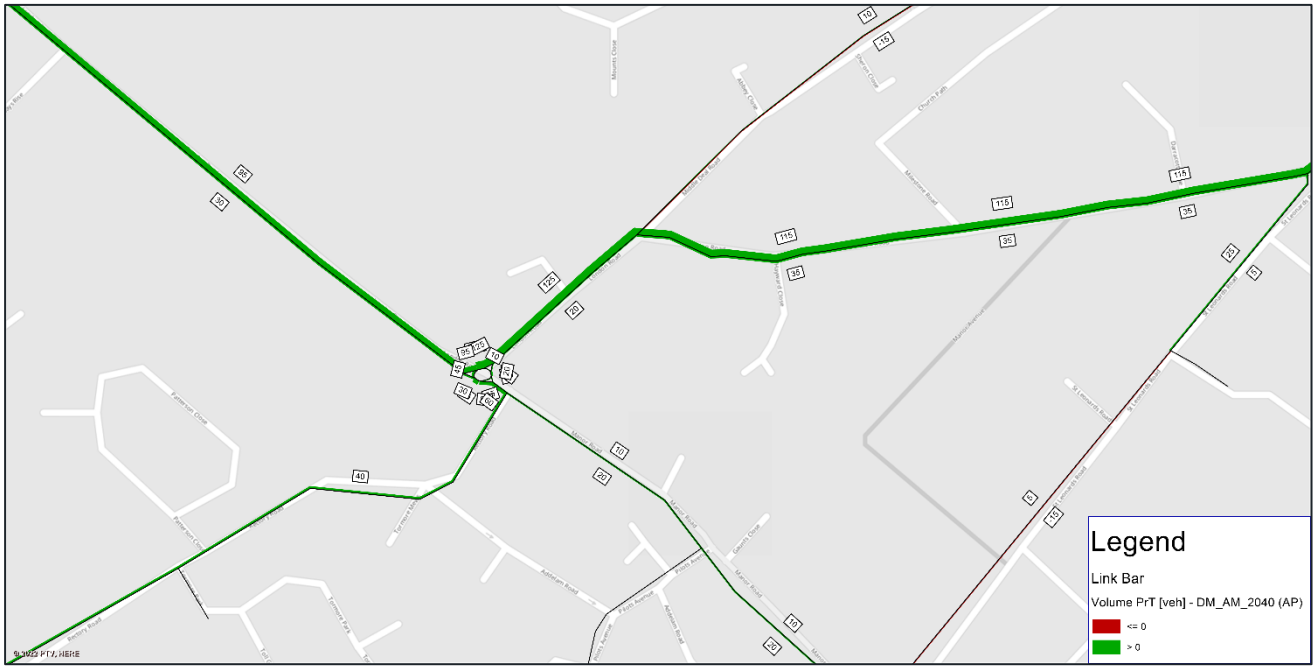


Figure 6-96: DDTM 2040 Do Something 2 with Mitigation - 2040 Do Minimum Actual Difference, London Road, AM Peak

6.9.19. Figure 6-97 presents the percentage flow changes in the Do Something scenario at the London Road/ Manor Road roundabout in the AM peak; an increase of flows of 15% is evident for traffic using Middle Deal Road towards Deal town centre. This increase is likely due to the potential residential allocations in the Sholden and Walmer area using this junction to gain access to employment sites in Deal town centre.

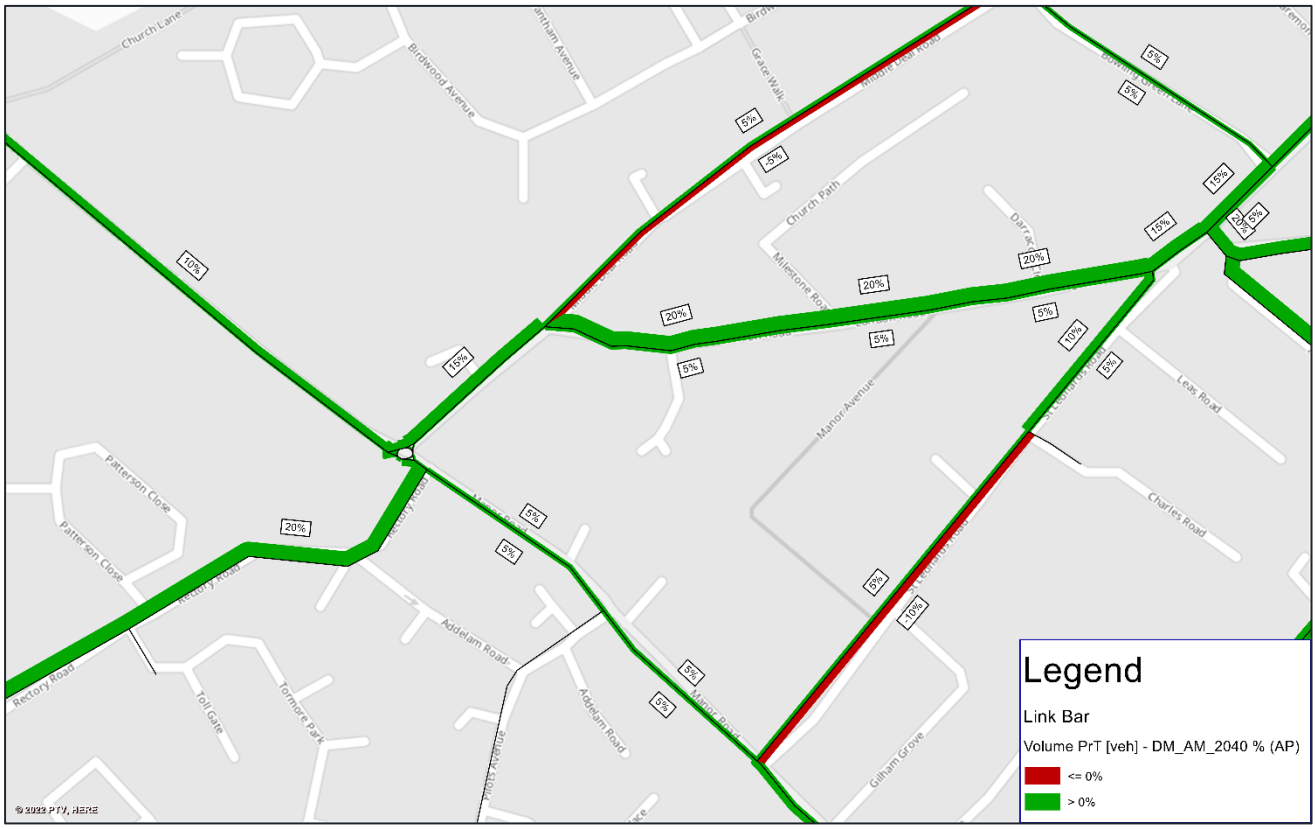


Figure 6-97: DDTM 2040 Do Something 2 with Mitigation - 2040 Do Minimum % Difference, London Road, AM Peak

6.9.20. Figure 6-98 shows the actual flow differences for the London Road Roundabout in the PM peak; all arms show an increase of flows ranging between 5-110 flows. The largest increase in flows is evident on London Road northbound, which the reflects the tidal nature of employment trips returning to residential areas.

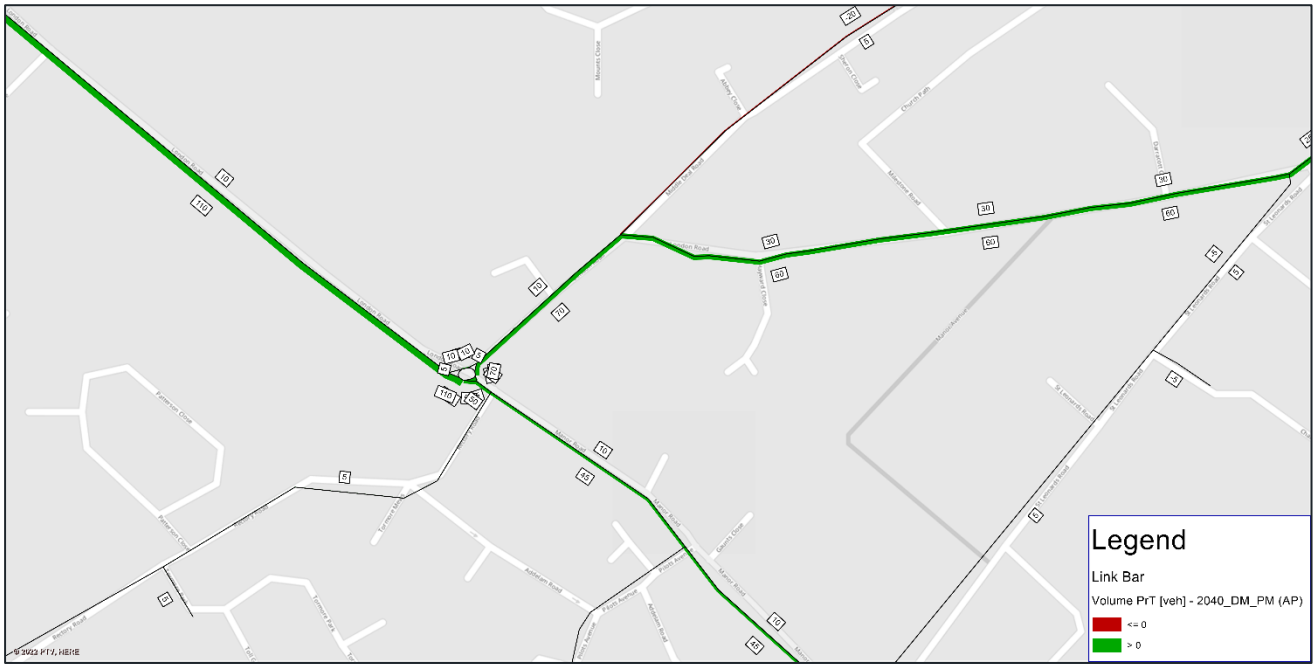


Figure 6-98: DDTM 2040 Do Something 2 with Mitigation - 2040 Do Minimum Actual Difference, London Road, PM Peak

6.9.21. Figure 6-99 presents the percentage flow differences for the London Road roundabout in the PM peak; all approach arms have increases of flow of approximately 10%.

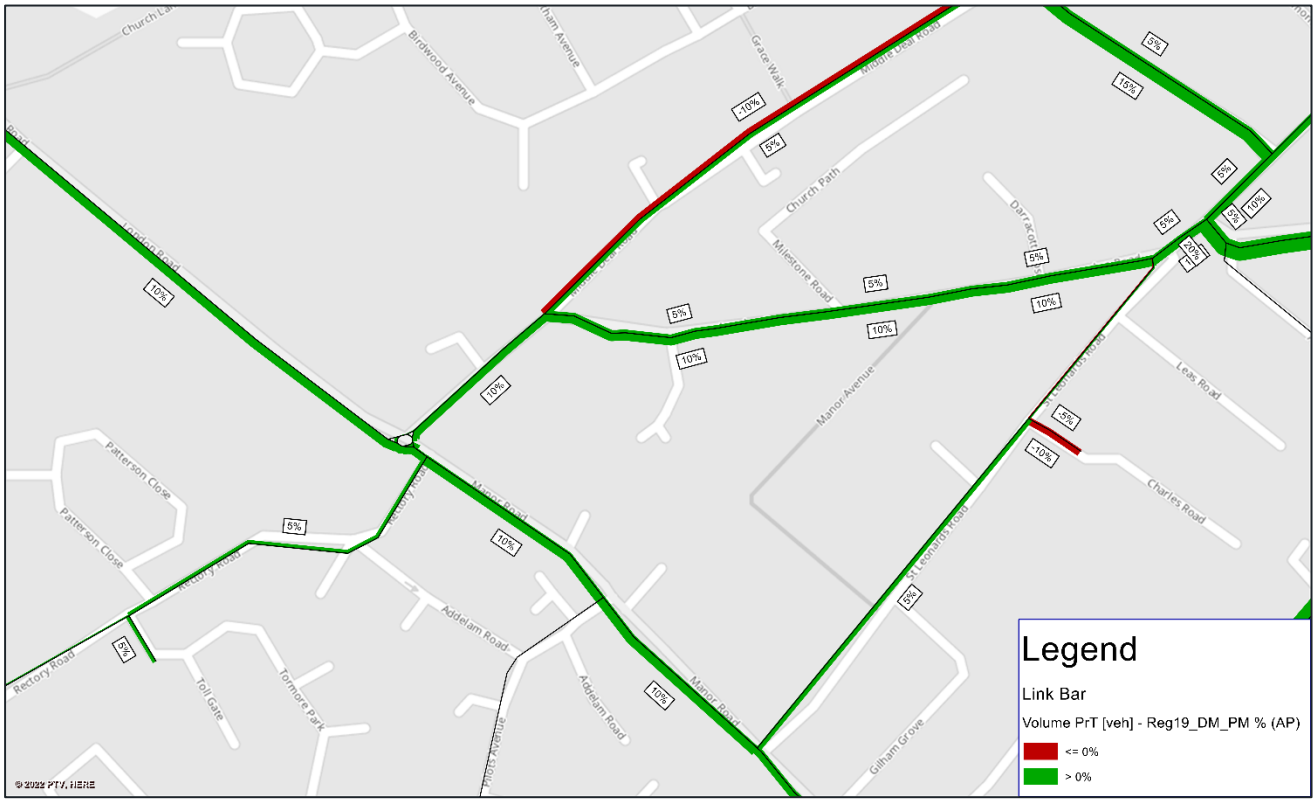


Figure 6-99: DDTM 2040 Do Something 2 with Mitigation - 2040 Do Minimum % Difference, London Road Roundabout, PM Peak

6.9.22. Figure 6-100 highlights the actual flow difference at the A256/Deal Road roundabout in Deal for the AM peak; the figure shows that there are slight changes in overall flows; an increase of an average 50 vehicles on A256 South and a decrease of an average 45 vehicle flows travelling on Deal Road.

6.9.23. It is noted that in the Do Minimum scenario, this junction is already shown to have significant queuing on the Deal Road and A256 southbound approaches, and as such any additional demand included within the Do Something further exacerbates this, making the junction appear extremely unattractive. The junction itself lies outside of the DDTM study area and so whilst it is useful to present changes in flow at this location, any impacts are caveated given this area was not within the base year validation or calibration process.

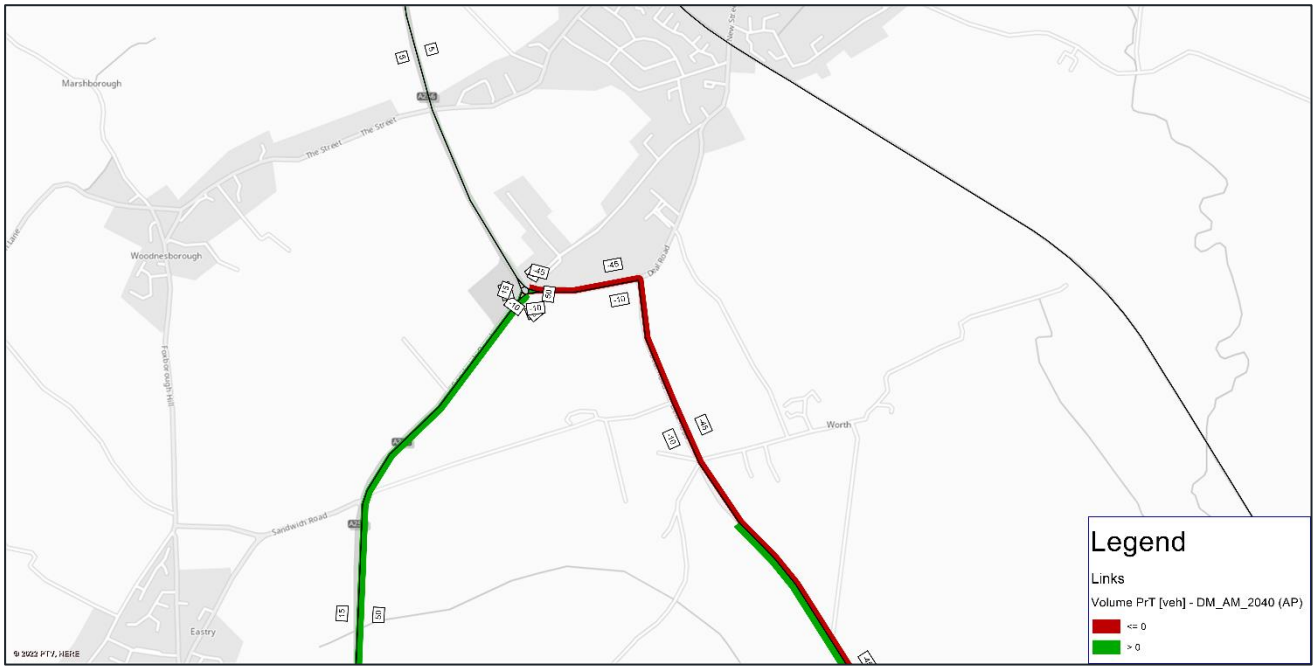


Figure 6-100: DDTM 2040 Do Something 2 with Mitigation - 2040 Do Minimum Actual Difference, A256/ Deal Road, AM Peak

6.9.24. Figure 6-101 presents the percentage flow change at the A256/ Deal Road roundabout in the AM peak, all differences are negligible, less than 5%. In this scenario, the junction is shown to operate over capacity in the Do Minimum and there is very little increase in flow in DS2 at this location.

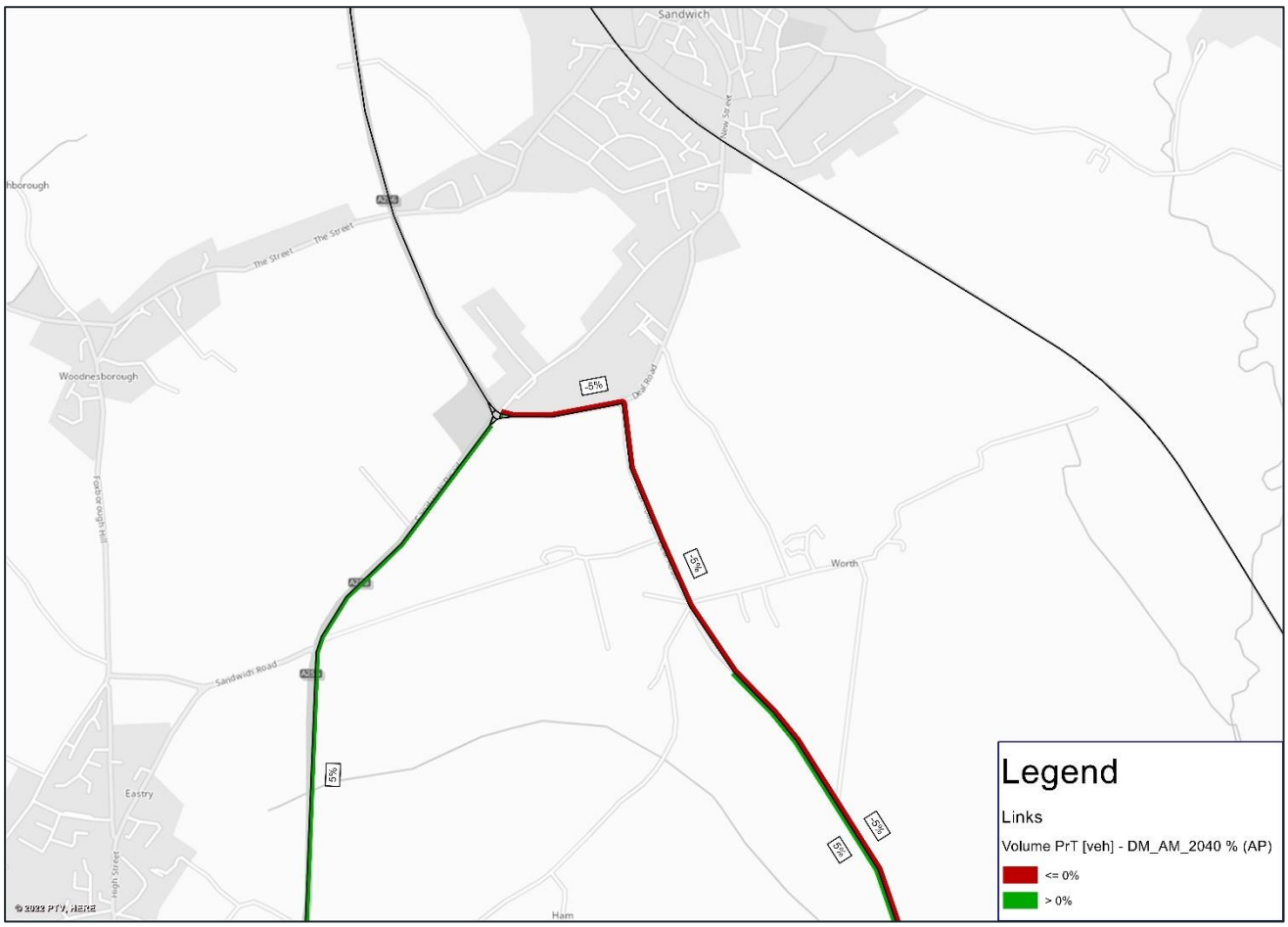


Figure 6-101: DDTM 2040 Do Something 2 with Mitigation - 2040 Do Minimum % Difference, A256/ Deal Road, AM Peak

6.9.25. Figure 6-102 highlights the actual flow differences for the A256/ Deal Road roundabout in the PM Peak; there is an increase in flows on all approach varying between 5 – 165 vehicles. This demonstrates a different trend to that of the AM Peak; this junction experiences significantly less queueing in the PM Do Minimum model (queues are observed on the A256 southbound arm only) and as such when adding trip generation from Local Plan allocations, there is still considered to be capacity at this junction and therefore flow increases are more prominent in the PM peak.

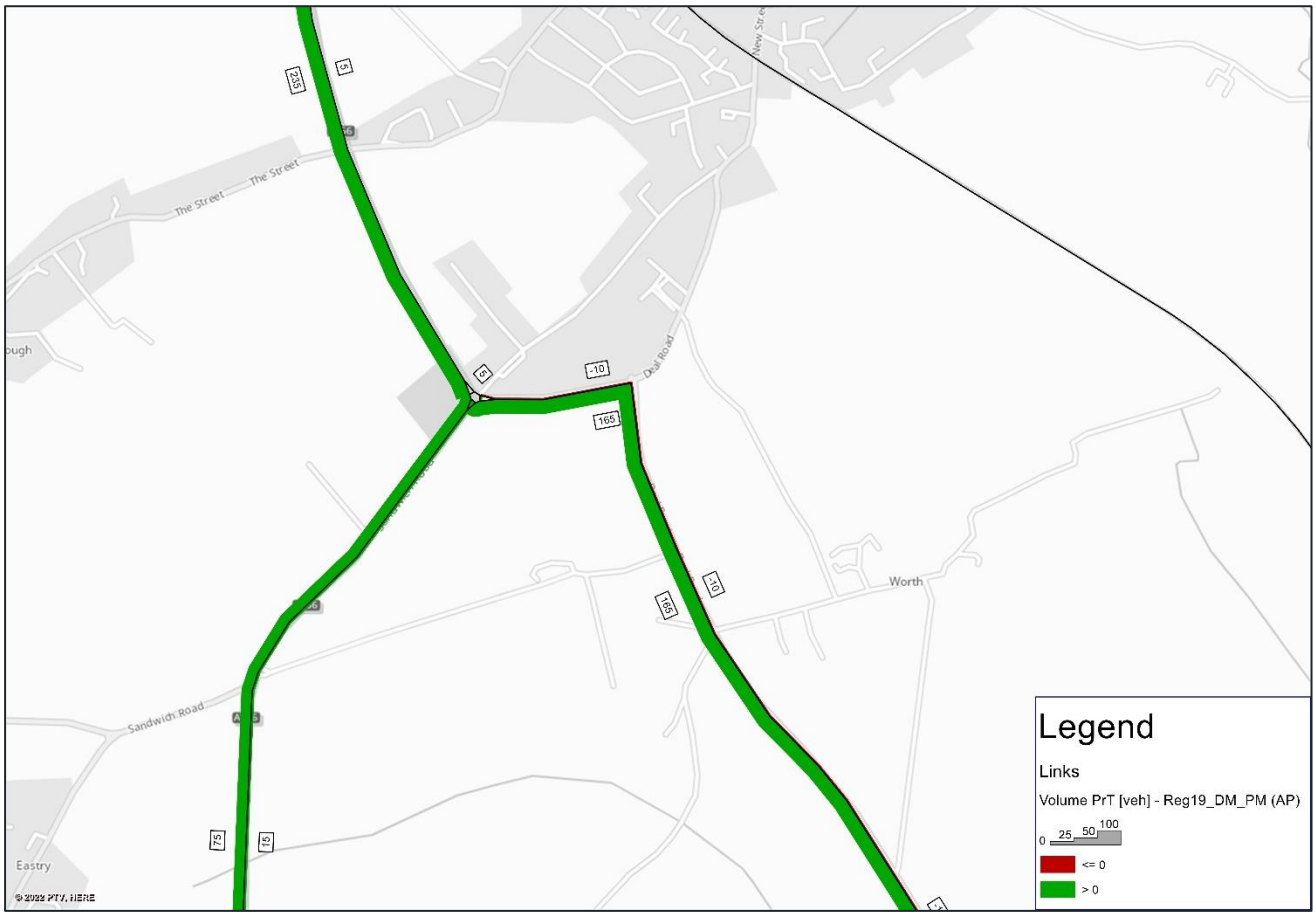


Figure 6-102: DDTM 2040 Do Something 2 with Mitigation - 2040 Do Minimum Flow Difference, A256/ Deal Road, PM Peak

6.9.26. Figure 6-103 presents the actual flow percentage difference for the A256/ Deal Road roundabout in the PM Peak; the A256 northbound and Deal Road approach arms are noted to have increased flow of 10% and 20% respectively, the A256 northbound exit arm has increases of 15% of flow.

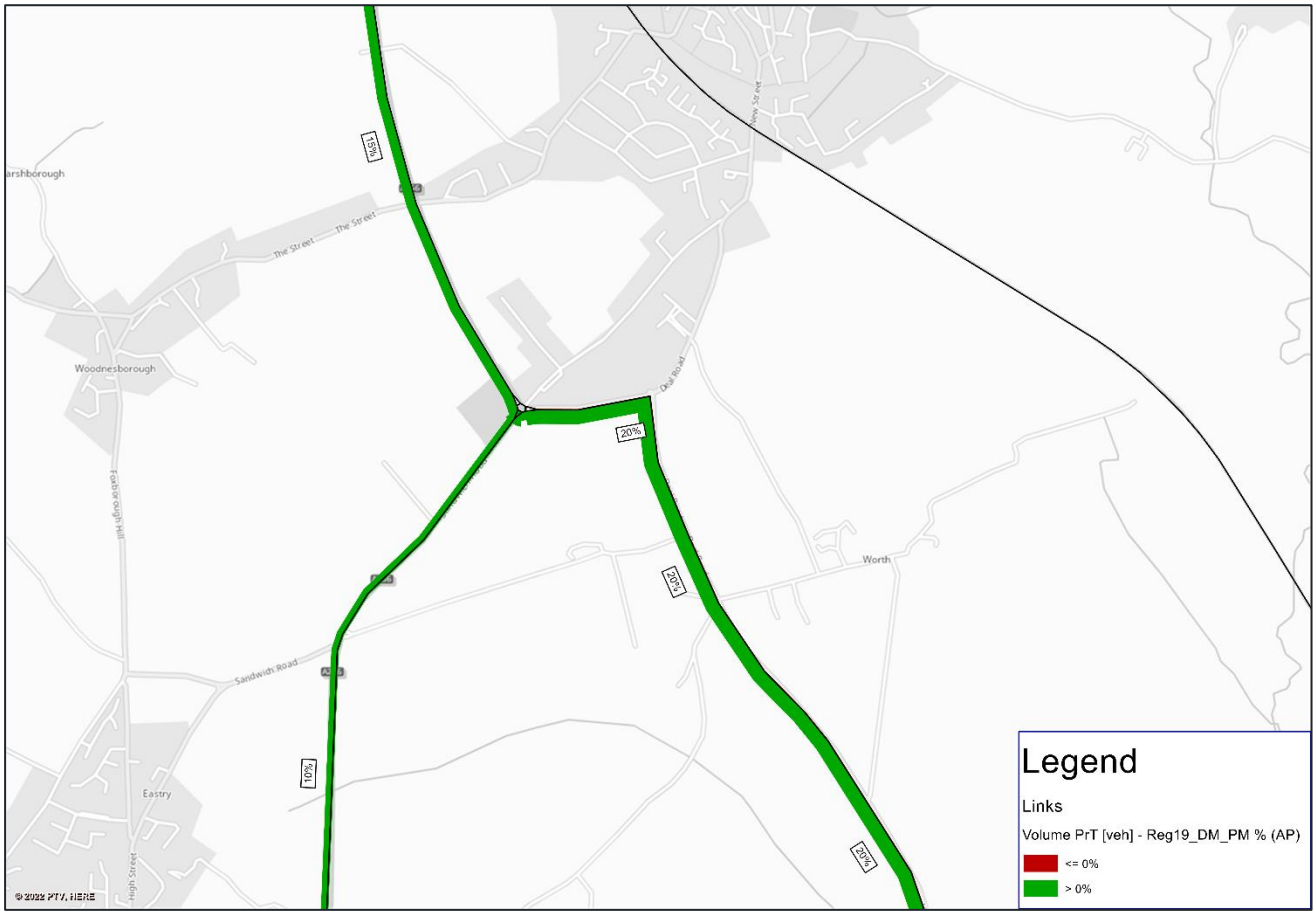


Figure 6-103: DDTM 2040 Do Something 2 with Mitigation - 2040 Do Minimum % Difference, A256/ Deal Road, PM Peak

6.10 Do Something 2 with Mitigation, Volume over Capacity Assessment

6.10.1. The volume over capacity assessment has also been undertaken to determine and classify the impact on links and nodes within the 2040 DS2 scenario, as a result of incorporating the Regulation 19 sites, with the 4,930 units at Whitfield Urban Expansion allocation. The assessment will help to identify possible links and nodes which are likely to experience capacity issues or be approaching capacity constraints when the Local Plan sites are included; it will be useful in monitoring the operation of links and nodes which are already shown to be approaching capacity in the 2040 Do Minimum and help to identify any additional areas for monitoring or mitigation.

6.10.2. The description of the threshold used to undertake the analysis are presented in Table 6-12, earlier in this chapter.

6.10.3. Figure 6-104 and Figure 6-105 show the V/C impacts on links and nodes within the full extent of the DDTM 2040 Do Something model area in the AM and PM peak respectively; the impacts on a localised level within Dover and Deal are discussed later within this chapter.



Figure 6-104: DDTM 2040 Do Something 2 with Mitigation, V/C Assessment, Full Model Extent, AM Peak

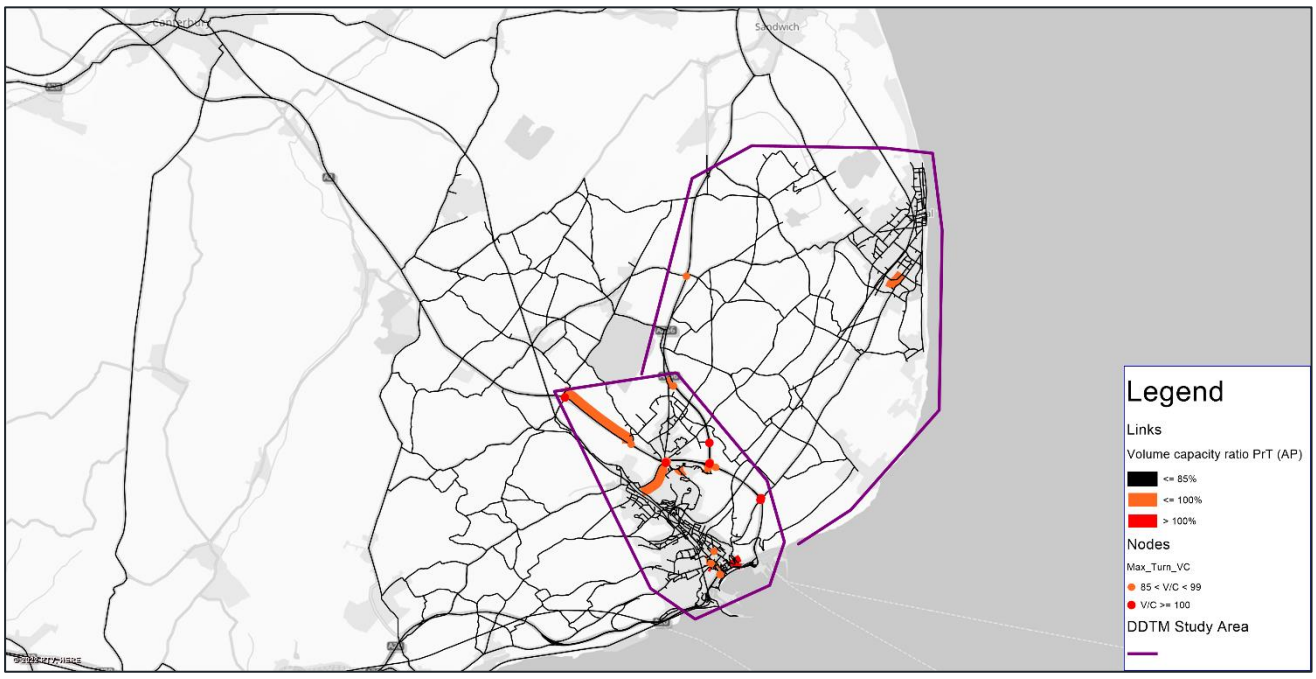


Figure 6-105: DDTM 2040 Do Something 2 with Mitigation, V/C Assessment, Full Model Extent, PM Peak

6.10.4. Figure 6-106 presents the V/C assessments on links and nodes within the Dover area in the AM peak categorised using the thresholds summarised in Table 6-12, with Figure 6-107 presenting a more detailed close-up of Whitfield roundabout, the A256/A2 grade-separated junction and the Duke of York roundabout.

6.10.5. Folkestone Road link is operating close to capacity (93%) in the Eastbound direction; this is a slight deterioration to that of the Do Minimum model where the road nears capacity (83%), this increase in V/C in the location is likely as a result of the Local Plan developments routing along this link to access/egress Dover town centre.

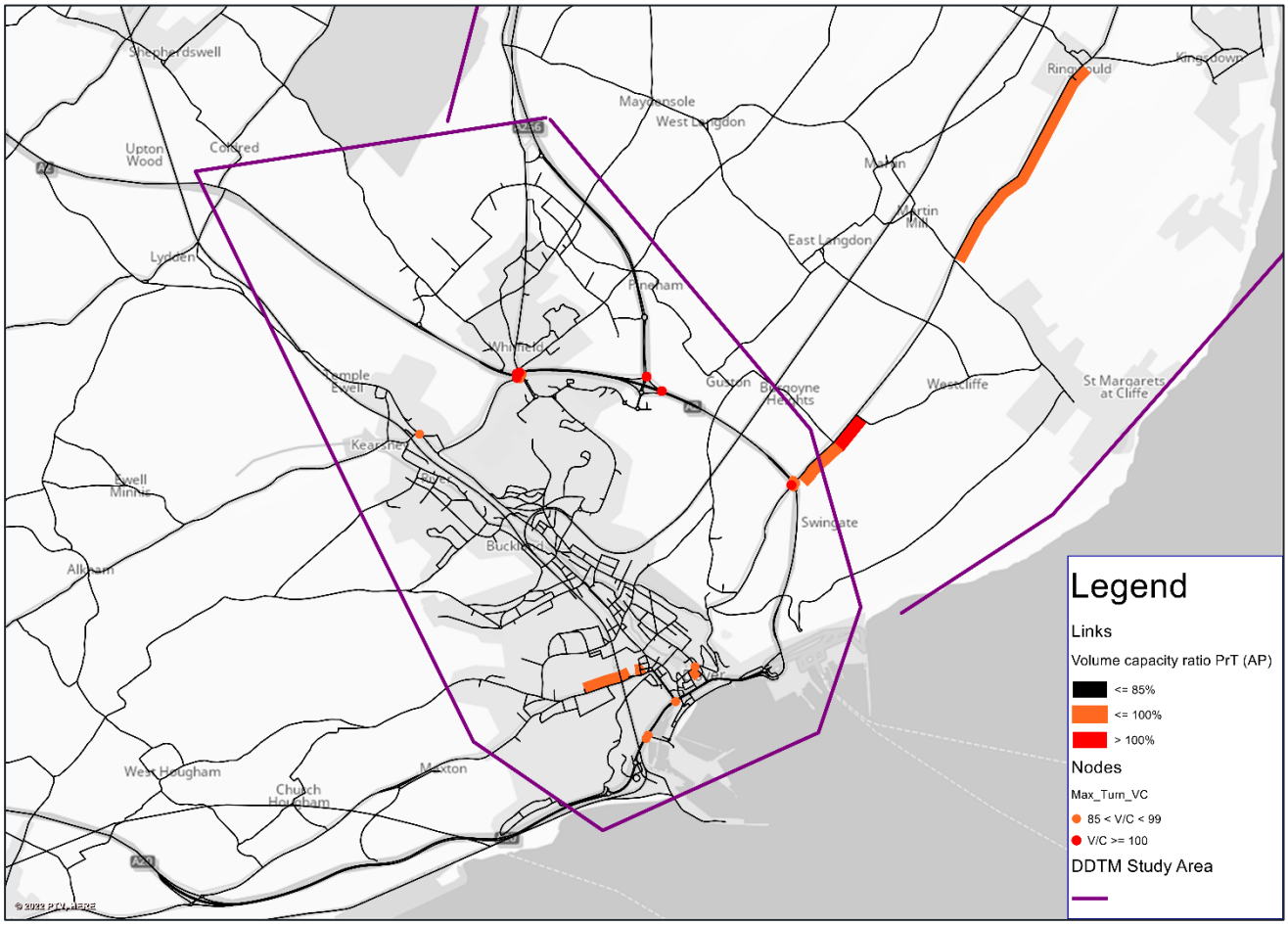


Figure 6-106: DDTM 2040 Do Something 2 with Mitigation, V/C Assessment, Dover, AM Peak

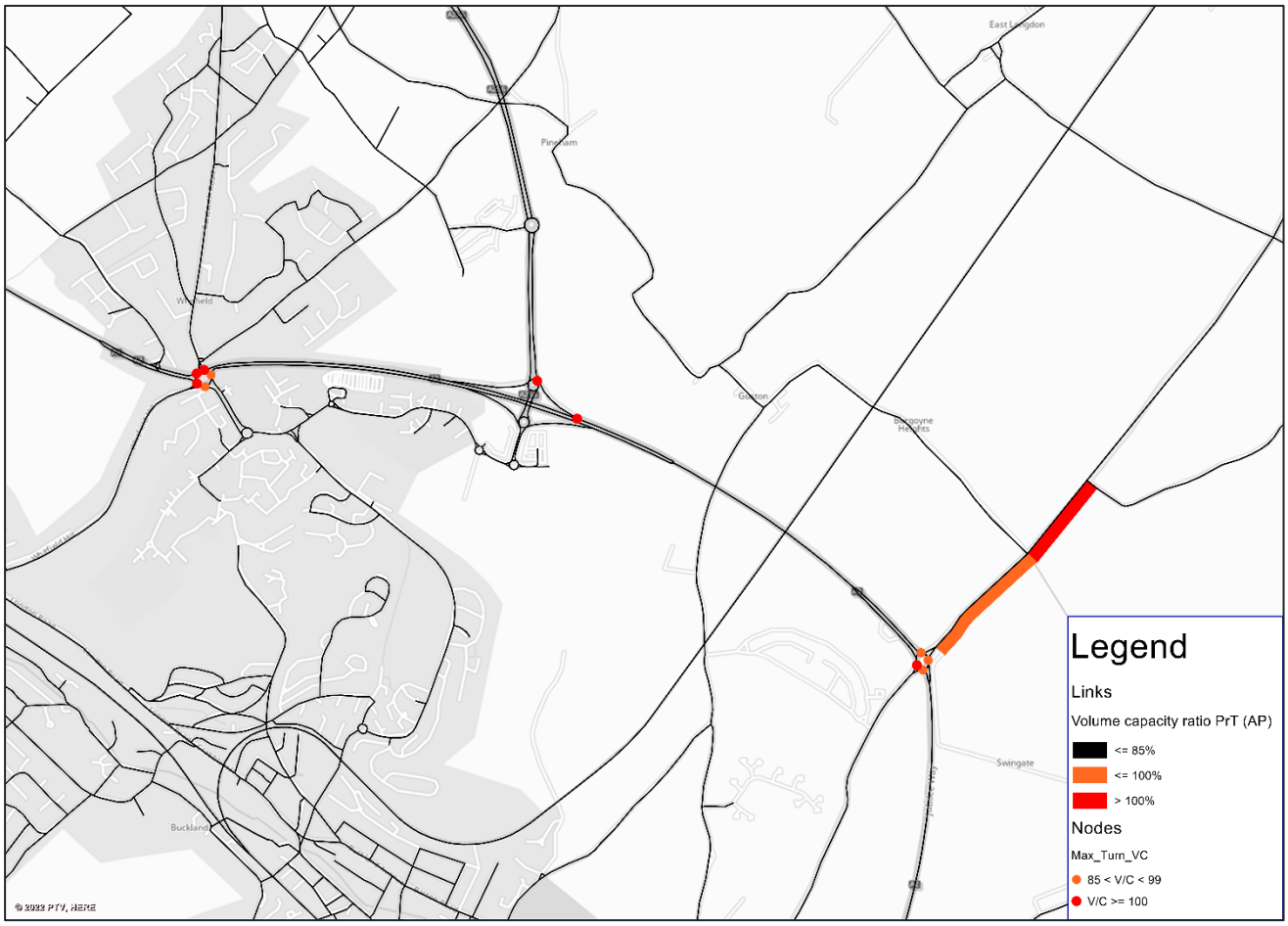


Figure 6-107: DDTM 2040 Do Something 2 with Mitigation, V/C Assessment, Dover Key Junctions, AM Peak

6.10.6. Figure 6-107 demonstrates that the A258 Deal Road is nearing capacity on approach to the Duke of York roundabout, this is as a result of the junction improvements increasing capacity and as a result increasing flows using the junction.

6.10.7. As with the DS1 scenario, the A256 southbound approach to the A2/A256 junction operates overcapacity 104% as a result of the Local Plan sites in the locality. White Cliffs Business Park proposed to attract a significant number of employment trips in the AM Peak; a significant number of residential Whitfield Urban Expansion trips also egress the development via the A256 junction in the AM peak. The combination of these potential site allocations within the immediate proximity of the A256/A2 grade separated junction is likely to account for the increases in delay and V/C exceeding 100. Detailed junction modelling has been undertaken at this junction and is presented in Chapter 8.

6.10.8. For the PM Peak, Figure 6-108 presents the V/C assessments on links and nodes within the Dover area and Figure 6-109 presents a more detailed close-up of Whitfield roundabout, the A256/A2 grade-separated junction and the Duke of York roundabout.

6.10.9. Figure 6-108 shows that, unlike the AM all links surrounding the Duke of York roundabout are within capacity. The Whitfield Hill southbound link has a V/C value of 86%, this nears capacity, whereas it was within capacity in the DM scenario (69%). The Whitfield development road and new development roundabout near capacity, the development road was within capacity in the DS1 scenario suggesting that the additional dwellings as part of WUE decrease the capacity.

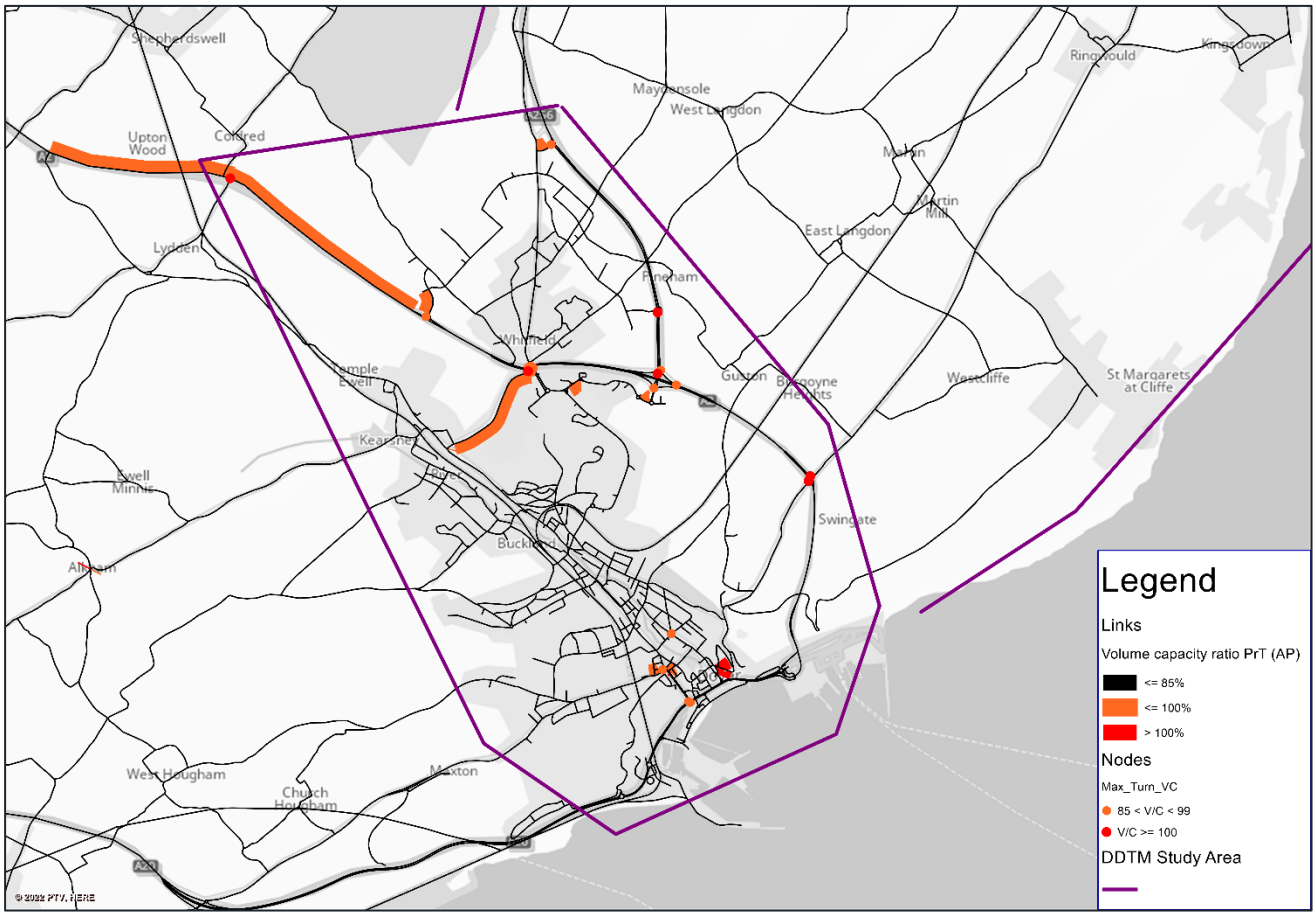


Figure 6-108: DDTM 2040 Do Something 2 with Mitigation, V/C Assessment, Dover, PM Peak

6.10.10. Figure 6-109 demonstrates that in the PM peak, the Whitfield roundabout and Duke of York roundabouts are shown to near or exceed capacity on all approaches, the performance at this junction is similar to that presented for the DS1. It is important to note that the flows at these junctions have been assessed in detailed junction models using TRANSYT and the resulting performance has been agreed with KCC and NH, see Chapter 8.

6.10.11. In the PM peak, the departure of trips from the White Cliffs Business Park are seen to directly impact operation at the A2/A256 junction with the northbound approach exceeding capacity this is the reverse to what was shown in the AM peak, suggesting the return trips from the employment site towards residential sites in the north.



Figure 6-109: DDTM 2040 Do Something 2 with Mitigation, V/C Assessment, Dover Key Junctions, PM Peak

6.10.12. Figure 6-110 presents the V/C assessments on links and nodes within Deal in the AM peak categorised using the thresholds summarised in Table 6-12**.**

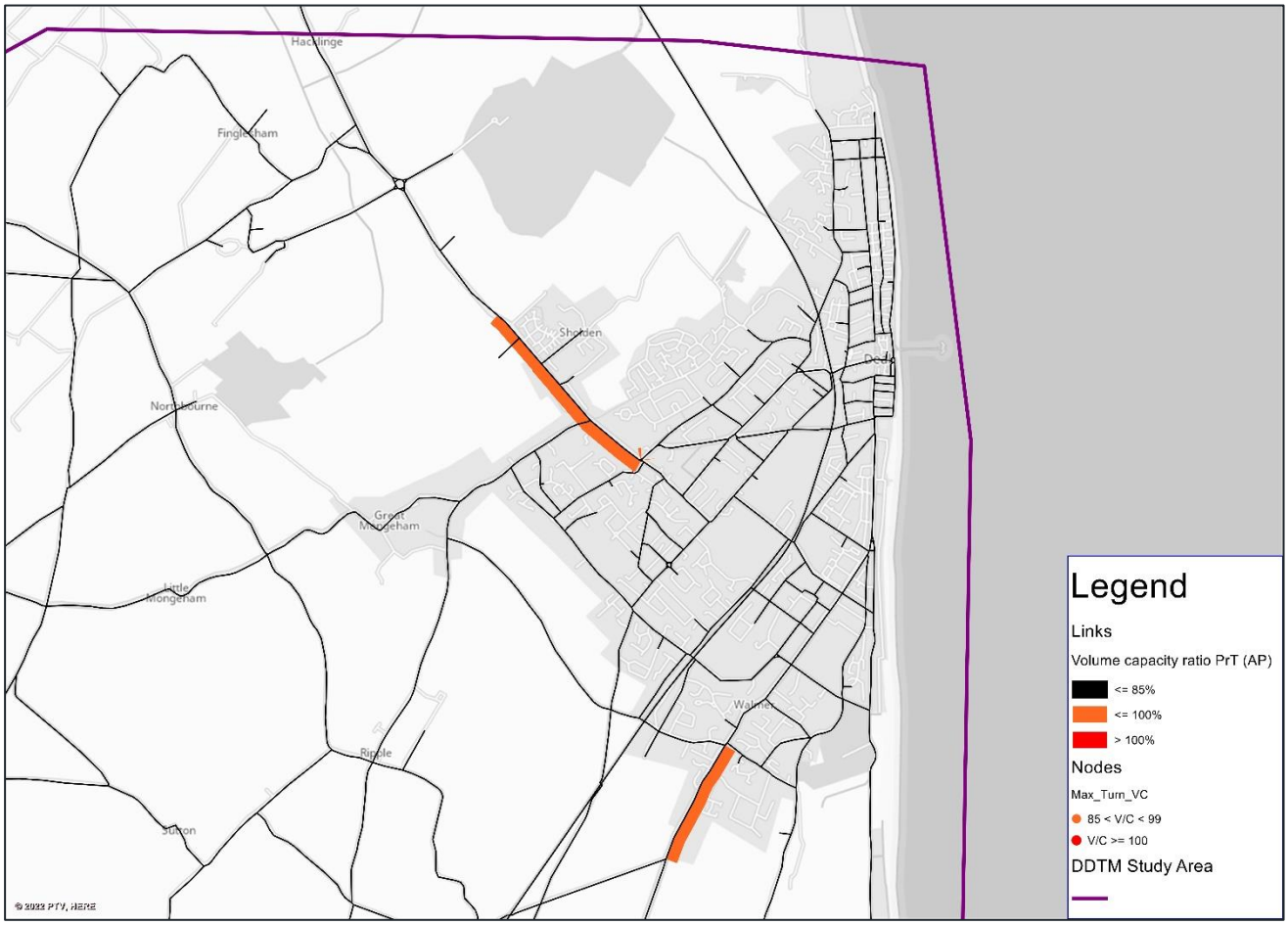


Figure 6-110: DDTM 2040 Do Something 2 with Mitigation, V/C Assessment, Deal, AM Peak

6.10.13. The V/C assessment within Deal demonstrates less significant capacity constraints when compared with Dover, link V/C of 97% is observed on the A258 northbound near Sholden, however this is only a slight deterioration to the performance of the DM (95%). The A258 Deal Road southbound also nears capacity, this is due to the additional demand using this route with the Duke of York junction improvements.

6.10.14. Figure 6-111 presents the V/C assessments on links and nodes within Deal in the PM Peak; it shows that the majority of links and nodes within Deal operate within capacity, with the exception of the A258 northbound through Walmer.

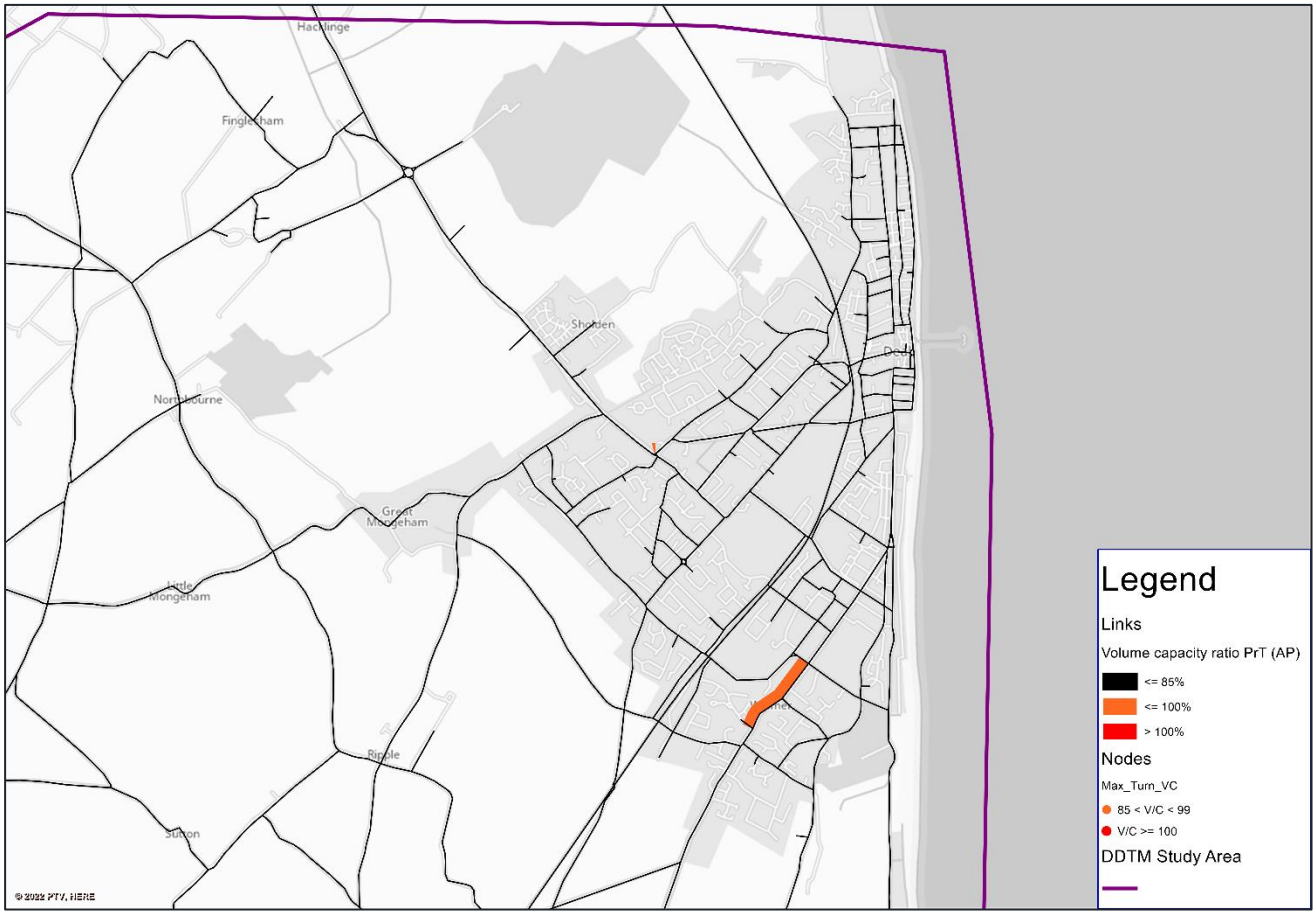


Figure 6-111: DDTM 2040 Do Something with Mitigation, V/C Assessment, Deal, PM Peak

6.10.15. The V/C assessment has been undertaken on the 2040 DS2 to determine which links and junctions were over capacity as a result of the additional demand generated by the potential site allocations. The assessment has demonstrated that Whitfield roundabout and Duke of York roundabout are forecast to operate over capacity, however TRANSYT modelling has been undertaken using the VISUM flows and highlighted that the junction performance is within capacity and this has been agreed with KCC and NH.

6.10.16. In addition, the combination of the Whitfield Urban Expansion and the large employment site at White Cliffs Business Park places additional pressure on the strategic network and the tidal movements are shown to impact the V/C level at the A2/A256 grade separated junction in the AM and PM peak. Both junction modelling and merge and diverge assessments have been undertaken at the junction which demonstrate it operates within capacity, outlined in detail in Chapter 8.

6.10.17. Table 6-15 details the changes in V/C at key links and nodes identified within Do Minimum and Do Something 2 models as approaching or being over capacity in the AM or/ and PM Peaks. If there is an exceedance of 85% the text is coloured orange, if the performance is over 100% the text is coloured red.

Table 6-15: V/C Links and Nodes Summary, Do Something 2 with Mitigation vs Do Minimum

Network Location within DDTM Study Area		Do Minimum		Do Something 2	
		AM Peak	PM Peak	AM Peak	PM Peak
Link	A256 Whitfield Hill Southbound from Whitfield roundabout	64	69	44	86
	A256 Whitfield Hill / London Road roundabout	77	88	80	79
	A256 Whitfield Hill roundabout / London Rd roundabout; Circulatory Arm	58	84	62	94
	A258 Deal Road Southbound; Approach to DoY, north of The Lane	74	48	103	54
	A258 Northbound, North of Church Street Junction to Granville/ Salisbury Road	63	74	79	87
	Whitfield Development Road from Sandwich Road to A256 roundabout, Eastbound			80	94
	Honeywood Parkway roundabout; Circulatory Arm	65	44	48	91
	Honeywood Parkway Westbound; west of Honeywood Close	55	46	52	87
	Honeywood Parkway/ Fitness Field roundabout; Eastbound Exit	20	38	31	89
	Honeywood Parkway Eastbound	20	38	31	89
	Honeywood Parkway/ B&Q roundabout Circulatory	38	64	56	87
	Honeywood Parkway/ Fitness Fields; Circulatory Arm	21	38	32	90
	A258 London Road, North of Mongeham Way Junction	90	65	94	72
	A258 London Road Northbound	95	61	97	69
	A258 London Road/ Manor Road Roundabout; Circulatory Arm	108	72	113	80
	A258 London Road/ Manor Road Roundabout; Circulatory Arm	94	74	96	79
	Northern part of London Road / Manor Road roundabout	81	86	89	87
	Castle Hill Road/ St James Street SB	75	114	61	110
	Dover Road Southbound, South of Hawksdown Junction	72	45	93	53
	Biggin Street Westbound between Worthington Street and Priory Street	69	74	81	104
	Priory Street Southbound - Towards roundabout	61	69	73	97
	Castle Street Westbound, South of Maison Dieu Road	80	61	86	60
	Folkestone Rd Eastbound - Approaching A256 York St/ Priory Road roundabout	81	83	92	94
	A2 Eastbound, Coldred	72	70	74	96
Node	Whitfield Roundabout, A2 West Approach	94	98	100	94
	Whitfield Roundabout, Whitfield Hill Approach	99	100	102	107
	Whitfield Roundabout, Sandwich Road Approach	103	103	112	95
	Whitfield Roundabout, A2 East Approach	100	87	91	98
	Whitfield Roundabout, Honeywood Road Approach	85	89	85	98
	Duke of York roundabout - A2 West Approach	105	101	95	100
	Duke of York roundabout - A2 Jubilee Way Approach	90	99	92	97
	Duke of York roundabout - A258 Deal Road North Approach	105	68	98	62
	Duke of York roundabout - A258 Deal Road South Approach	84	105	99	108
	A256 / A2 Northern Roundabout; Northbound Approach	39	60	55	104
	A256 / A2 Northern Roundabout; Southbound approach	85	50	115	85
	A2 Eastbound onslip from A256/ A2 Northern roundabout	72	55	109	91
	A256/ A2 Southern Roundabout; Northbound Approach from Honeywood Parkway	17	31	28	86
	Whitfield Development Roundabout at NE of Site tying in at A256; Western Approach			81	86
	Western Approach to proposed roundabout on A2 leading to Whitfield Access Road.			56	97
	A265/ Richmond Way Roundabout, A256 Northbound Approach	45	77	61	107
	A20 Limekiln Street/ Union Street Signalised junction	88	74	97	72
	A20 Limekiln Street/ Snargate Street /Union Street Signalised Junction	84	70	85	69
	Castle Street/ MaisonDieu Road Signalised junction	82	95	85	84
	A20 Snargate St/ York St Signalised Junction	70	78	84	89
	A20 Snargate St/ York St Signalised Junction	74	81	88	93
	A256 Maison Dieu / Park Avenue / Godwyne Road / Park Street Signalised Junction	68	82	68	86
	London Road / Alkham Valley Road Junction	59	61	89	73
	Dover Road/ Boys Hill Roundabout, A256 North Approach	95	62	113	65
	A256 Dover Road/ Dover Road Roundabout, A256 Dover Road NE Approach	75	46	87	51

6.10.18. Summary tables and flow difference plots have demonstrated increases in vehicle volumes at Whitfield Roundabout, the A2/A256 grade-separated junction and the Duke of York roundabout in both the Do Minimum and Do Something scenarios. The strategic models have indicated the increased flow at the A256/ A2 interchange and London Road/ Alkham Valley Road junction could trigger volume over capacity constraints at these junctions and lead to re-routing away from these areas. Detailed junction models have been undertaken at these junctions and all results are presented in Chapter 8.

6.10.19. WSP and DDC have discussed the V/C links and nodes highlighted as part of this exercise with NH and KCC and Table 6-16 below shows the current agreed approach to dealing with the issues generated by the Local Plan. All cells coloured green indicate no outstanding issues with KCC/NH, all cells which are orange indicate some outstanding issues to be agreed with NH/KCC

6.10.20. WSP have produced a Technical Note on the DS1 and DS2 results which incorporates all NH comments raised as part of the Regulation 18 process. This Technical Note can be found in Appendix M, in separate document.

6.10.21. In summary the key differences between DS1 and DS2 are the additional trips generated by the Whitfield development. The additional trips from the Whitfield development generated within DS2 impact the capacity on the key junctions and roads in close proximity to the development such as the proposed Whitfield highway network and junctions and Whitfield roundabout, A2/A256 dumbell roundabout Duke of York junctions. Table 4 within the Executive summary provides a direct comparison of V/C results between DS1 and DS2.

Table 6-16: V/C Links and Nodes Comments Summary

Area	Location	Junction/ Road	Identified By	Status	Action
Dover	Duke of York Roundabout	Junction	DDTM	Junction modelling completed of Local Plan solution and agreed with KCC/NH	See SoCG
Dover	A20 Limekiln Street/ Union Street Signalised junction	Junction	DDTM	Signalised junction, will be optimised on ground in future year	NH to review updated Reg 18 comments Technical Note to be provided within the Reg 19 Forecasting Report (Appendix M in separate document)
Dover	A20 Limekiln Street/ Snargate Street /Union Street Signalised Junction	Junction	DDTM	Signalised junction, will be optimised on ground in future year	None
Dover	A20/ A256 Woolcomber Street	Junction	NH	Signalised junction, will be optimised on ground in future year	NH to review updated Reg 18 comments Technical Note to be provided within the Reg 19 Forecasting Report (Appendix M in separate document)
Dover	Castle Street/ MaisonDieu Road Signalised junction	Junction	DDTM	Signalised junction, will be optimised on ground in future year	None
Dover	A20 Snargate St/ York St Signalised Junction	Junction	DDTM	Signalised junction, will be optimised on ground in future year	None
Dover	A20 Snargate St/ York St Signalised Junction	Junction	DDTM	Signalised junction, will be optimised on ground in future year	None
Dover	A256 Maison Dieu / Park Avenue / Godwyne Road / Park Street Signalised Junction	Junction	DDTM	Signalised junction, will be optimised on ground in future year	None
Dover	A256 Whitfield Hill Southbound from Whitfield Rbt	Road	DDTM	Assessed through strategic model V/C within acceptable limits. No further action necessary.	None
Dover	A256 Whitfield Hill / London Road roundabout	Road	DDTM	Assessed through strategic model V/C within acceptable limits. No further action necessary.	None
Dover	A256 Whitfield Hill Rbt/ London Rd Rbt; Circulatory Arm	Road	DDTM	Assessed through strategic model V/C within acceptable limits. No further action necessary.	None
Dover	A258 Deal Road Southbound; Approach to DoY	Road	DDTM	More traffic now using A258 Southbound as more traffic able to access the links with implementation of the DOY roundabout mitigation. 60% of the additional traffic with mitigation is related to non-Local Plan trips. Junction modelling shows the junction works.	None
Dover	A258 Deal Road Southbound; Approach to DoY, north of The Lane	Road	DDTM	More traffic now using A258 Southbound as more traffic able to access the links with implementation of the DOY roundabout mitigation. 60% of the additional traffic with mitigation is related to non-Local Plan trips. Junction modelling shows the junction works.	None
Dover	A258 Dover Road Southbound;Between Station Road and Front Street	Road	DDTM	Link only just over 85% - 86%/87% in PM peak. More traffic now using A258 Southbound as more traffic able to access the links with implementation of the DOY roundabout mitigation. 60% of the additional traffic with mitigation is related to non-Local Plan trips. Junction modelling shows the junction works.	None
Whitfield	Honeywood Parkway roundabout; Circulatory Arm	Road	DDTM	Assessed through strategic model V/C within acceptable limits. No further action necessary.	None
Whitfield	Honeywood Parkway Westbound; west of Honeywood Close	Road	DDTM	Assessed through strategic model V/C within acceptable limits. No further action necessary.	None
Whitfield	Honeywood Parkway/ Fitness Field Rbt; Eastbound Exit	Road	DDTM	Assessed through strategic model V/C within acceptable limits. No further action necessary.	None
Whitfield	Honeywood Parkway Eastbound; between Fitness Fields and B&Q rbt	Road	DDTM	Assessed through strategic model V/C within acceptable limits. No further action necessary.	None
Whitfield	Honeywood Parkway/ B&Q Rbt; Eastbound Arm from Honeywood Parkway	Road	DDTM	Assessed through strategic model V/C within acceptable limits. No further action necessary.	None
Whitfield	Honeywood Parkway/ B&Q Rbt Circulatory	Road	DDTM	Assessed through strategic model V/C within acceptable limits. No further action necessary.	None

Area	Location	Junction/ Road	Identified By	Status	Action
Whtifield	Honeywood Parkway/ Fitness Fields; Circulatory Arm	Road	DDTM	Assessed through strategic model V/C within acceptable limits. No further action necessary.	None
Dover	Castle Hill Road/ St James Street SB	Road	DDTM	This is occurring in the DDTM as a result of traffic avoiding the traffic signal at Castle Street/ Maison Dieu Road. Additional traffic in DS1 mainly result of Local Plan sites and just over 50% comes from WCBP and Whitfield which could be reduced by BRT. In DS2 sees an improvement in V/C compared to DM. Local Plan trips which go through links mainly comes from WCBP and Whitfield.	Dover Town centre sites to focus on sustainable transport modes rather than highway capacity improvements
Dover	St James Street SB	Road	DDTM	This is occurring in the DDTM as a result of traffic avoiding the traffic signal at Castle Street/ Maison Dieu Road. Additional traffic in DS1 mainly result of Local Plan sites and just over 50% comes from WCBP and Whitfield which could be reduced by BRT. In DS2 sees an improvement in V/C compared to DM. Local Plan trips which go through links mainly comes from WCBP and Whitfield.	Dover Town centre sites to focus on sustainable transport modes rather than highway capacity improvements
Dover	Biggin Street Westbound between Worthington Street and Priory Street	Road	DDTM	Of the additional traffic in DS1/ DS2 accounts less than 50% is attributed to the Local Plan. BRT reduces V/C in both AM and PM peak.	Dover Town centre sites to focus on sustainable transport modes rather than highway capacity improvements
Dover	Priory Street Southbound - Towards Rbt	Road	DDTM	Of the additional traffic in DS1/ DS2 accounts less than 50% is attributed to the Local Plan. BRT reduces V/C in both AM and PM peak.	Dover Town centre sites to focus on sustainable transport modes rather than highway capacity improvements
Dover	Castle Street Westbound, South of Maison Dieu Road	Road	DDTM	Link only just over 85% - 86% in AM Peak DS2.	Dover Town centre sites to focus on sustainable transport modes rather than highway capacity improvements
Dover	B2011 Folkestone Rd Eastbound; between Malvern Road and Priory Gate Road	Road	DDTM	Local Plan growth attributing to these links over capacity in the DS AM Peaks. Neared capacity in DM.	Dover Town centre sites to focus on sustainable transport modes rather than highway capacity improvements
Dover	Folkestone Rd Eastbound; Approach to Effingham Street	Road	DDTM	66%/55% of the additional trips using this link in DS1/ DS2 are generated by zones which contain Local Plan sites.	Dover Town centre sites to focus on sustainable transport modes rather than highway capacity improvements
Dover	Folkestone Rd Eastbound - Approaching A256 York St/ Priory Road Rbt	Road	DDTM	66%/55% of the additional trips using this link in DS1/ DS2 are generated by zones which contain Local Plan sites.	Dover Town centre sites to focus on sustainable transport modes rather than highway capacity improvements
Dover	London Road / Alkham Road Junction	Junction	DDTM	WSP are undertaking junction modelling for this junction and identifying potential solutions.	Junction modelling and potential mitigation to be presented in the Reg 19 Forecasting Report for KCC review
Whitfield	Whitfield Roundabout	Junction	DDTM	Junction modelling completed of Local Plan solution and agreed with KCC/NH	See SoCG
Whitfield	A2/A256 Dumbbell Roundabouts	Junction	DDTM	Junction modelling completed and merge/ diverge assessments completed and agreed no mitigation necessary to accommodate Local Plan growth.	NH comments on modelling to reviewed, not expected to impact on conclusions. To be addressed in Reg 19 Forecasting Report

Area	Location	Junction/ Road	Identified By	Status	Action
Whitfield	A265/ Richmond Way Roundabout, A256 Northbound Approach	Junction	DDTM	Whitfield developers to assess these junctions in more detail as part of the development proposals.	Included in Policy SAP1
Whitfield	New A2 junction with Whitfield Access Road (western approach)	Junction	DDTM	Whitfield developers to assess these junctions in more detail as part of the development proposals.	Included in Policy SAP1
Whitfield	Whitfield Development Road from A2 Rbt to Singledge Lane, Northbound	Road	DDTM	Whitfield developers to assess these junctions in more detail as part of the development proposals.	Included in Policy SAP1
Whitfield	Whitfield Development Road from Sandwich Road to A256 Rbt, Eastbound	Road	DDTM	Whitfield developers to assess these junctions in more detail as part of the development proposals.	Included in Policy SAP1
Deal	A258 Northbound, North of Church Street Junction to Granville/ Salisbury Road	Road	DDTM	Link only just over 85% - 86%/87% in PM peak. More traffic now using A258 as more traffic able to access the links with implementation of the DOY roundabout mitigation. 60% of the additional traffic with mitigation is related to non-Local Plan trips. Junction modelling shows the junction works.	None
Deal	A258 London Road, North of Mongeham Way Junction	Road	DDTM	Junction identified as a constraint - no further development planned in area and no clear solution to junction apart from sustainable transport improvements.	None
Deal	A258 London Road Northbound, between The Street and Sholden New Road	Road	DDTM	V/C increases between DM and DS are small less than 4%.	None
Deal	A258 London Road Northbound	Road	DDTM	V/C increases between DM and DS are small less than 3%.	None
Deal	A258 London Road/ Manor Road Roundabout; Circulatory Arm	Road	DDTM	V/C increases between DM and DS are 5% or less, due to limited local plan growth as junction over capacity in DM with no mitigation options available	None
Deal	A258 London Road/ Manor Road Roundabout; Circulatory Arm	Road	DDTM	V/C increases between DM and DS are 2% or less.	None
Deal	Northern part of London Road / Manor Road Rbt	Road	DDTM	V/C increases between DM and DS are 8% or less.	None
Deal	Dover Road Southbound, South of Hawksdown Junction	Road	DDTM	Up to 32% of the additional trips using this link in DS1/ DS2 are generated by zones which contain Local Plan sites. Just over 60% of the new Local Plan traffic comes from either the WCBP (majority) or the Whitfield development. V/C only just over 90% in AM peak only.	
Deal	A258/ Station Road	Junctions	KCC	WSP are undertaking junction modelling for this junction and identifying potential solutions.	Junction modelling and potential mitigation to be presented in the Reg 19 Forecasting Report for KCC review
Deal	A256/A258	Junction	Reg 18	WSP are undertaking junction modelling for this junction.	Junction modelling to be presented in the Reg 19 Forecasting Report for KCC review
Deal	A257/ Sandwich Bypass	Junction	Reg 18	WSP are undertaking junction modelling for this junction.	Junction modelling to be presented in the Reg 19 Forecasting Report for KCC review
Edge of modelled area	Dover Road/ Boys Hill Roundabout, A256 North Approach	Junction	DDTM	This has been modelled and it was agreed on the meeting on 6th September no further work is required	None
Edge of modelled area	A256 Dover Road/ Dover Road Roundabout, A256 Dover Road NE Approach	Junction	DDTM	Considered through strategic model, no further action necessary.	None
Edge of modelled area	A2 Eastbound, West of link through Coldred	Road	DDTM	All of the additional trips using this link in DS1 and DS2 are generated by the Local Plan. 76%/74% of the additional traffic is associated with the Whitfield development	Junctions on A2 to be looked at
Edge of modelled area	A2 Eastbound, between link through Coldred and Coldred hill junction	Road	DDTM	All of the additional trips using this link in DS1 and DS2 are generated by the Local Plan. 76%/74% of the additional traffic is associated with the Whitfield development	Junctions on A2 to be looked at
Edge of modelled area	A2 Eastbound, East of Coldred Hill	Road	DDTM	All of the additional trips using this link in DS1 and DS2 are generated by the Local Plan. 76%/74% of the additional traffic is associated with the Whitfield development	Junctions on A2 to be looked at

Area	Location	Junction/ Road	Identified By	Status	Action
Outside modelled area	New Sandwich Road/ A256 roundabout (western arm approach)	Junction	DDTM	Whitfield developers to assess these junctions in more detail as part of the development proposals.	Ensure Whitfield developers assess
Outside of modelled area	Lydden Hill	Junctions	NH	NH requested further information to ensure junctions operating within capacity	Additional information provided in TN on changes between DM and DS, to be provided in the REg 19 Forecasting Report for NH review (Appendix M in separate document)
Outside of modelled area	Geddinge Lane/ Coxhill junction	Junctions	NH	NH requested further information to ensure junctions operating within capacity	Additional information provided in TN on changes between DM and DS, to be provided in the REg 19 Forecasting Report for NH review (Appendix M in separate document)
Outside of modelled area	A257 High Street / Harrison Rd / B2046 High Street / A257 Canterbury Rd	Junctions	Static Analysis	Static analysis completed and shared with KCC	Agreed to be addressed by Aylesham and/or Wingham site allocations
Outside of modelled area	B2046 Adisham Rd / Dorman Avenue	Junctions	Static Analysis	Static analysis completed and shared with KCC	Agreed to be addressed by Aylesham Site (SAP24)
Outside of modelled area	B2046 Adisham Rd / Spinney Lane	Junctions	Static Analysis	Static analysis completed and shared with KCC	Agreed to be addressed by Aylesham Site (SAP24)
Outside of modelled area	Ramsgate Rd / Sandwich Bypass	Junctions	Static Analysis	Static analysis completed and shared with KCC	None
Outside of modelled area	High Street / Church Street / Brooke Street / Lower Street	Junctions	Static Analysis	Static analysis completed and shared with KCC	None
Outside of modelled area	Wigmore Lane / Shooters Hill / Shepherdswell Rd / Church Hill	Junctions	Static Analysis	Static analysis completed and shared with KCC	Impact on rural road network analysis provided in Reg 19 forecasting report for KCC review
Outside of modelled area	A260 Canterbury Rd / Alkham Valley Rd	Junctions	Static Analysis	Static analysis completed and shared with KCC and NH	Awaiting response from KCC and NH

6.11 Do Something 1 with Mitigation vs Do Something 1 No Mitigation

6.11.1. To understand the impacts of the junction improvements at the Whitfield and Duke of York roundabouts in the Do Something 1 scenario with mitigation, flow difference plots have been produced comparing scenarios with and without the mitigation in the AM and PM peaks.

6.11.2. Figure 6-112 shows the differences in actual flows caused by the junction improvements in the AM peak of the DS1 Scenario. The figure shows that the improvements particularly at the Duke of York roundabout have moved traffic onto the strategic road network away from the rural roads which it as previously using before the mitigation was introduced. This is shown by the increases in flow on all arms of the Duke of York roundabout except the south western A258 approach, along with decreases in flows going through East and West Langdon, going westbound on Upper Road, and going West from Deal on Willow Woods Road. Flows around Whitfield roundabout do not change much with some increases and decreases on approach roads.

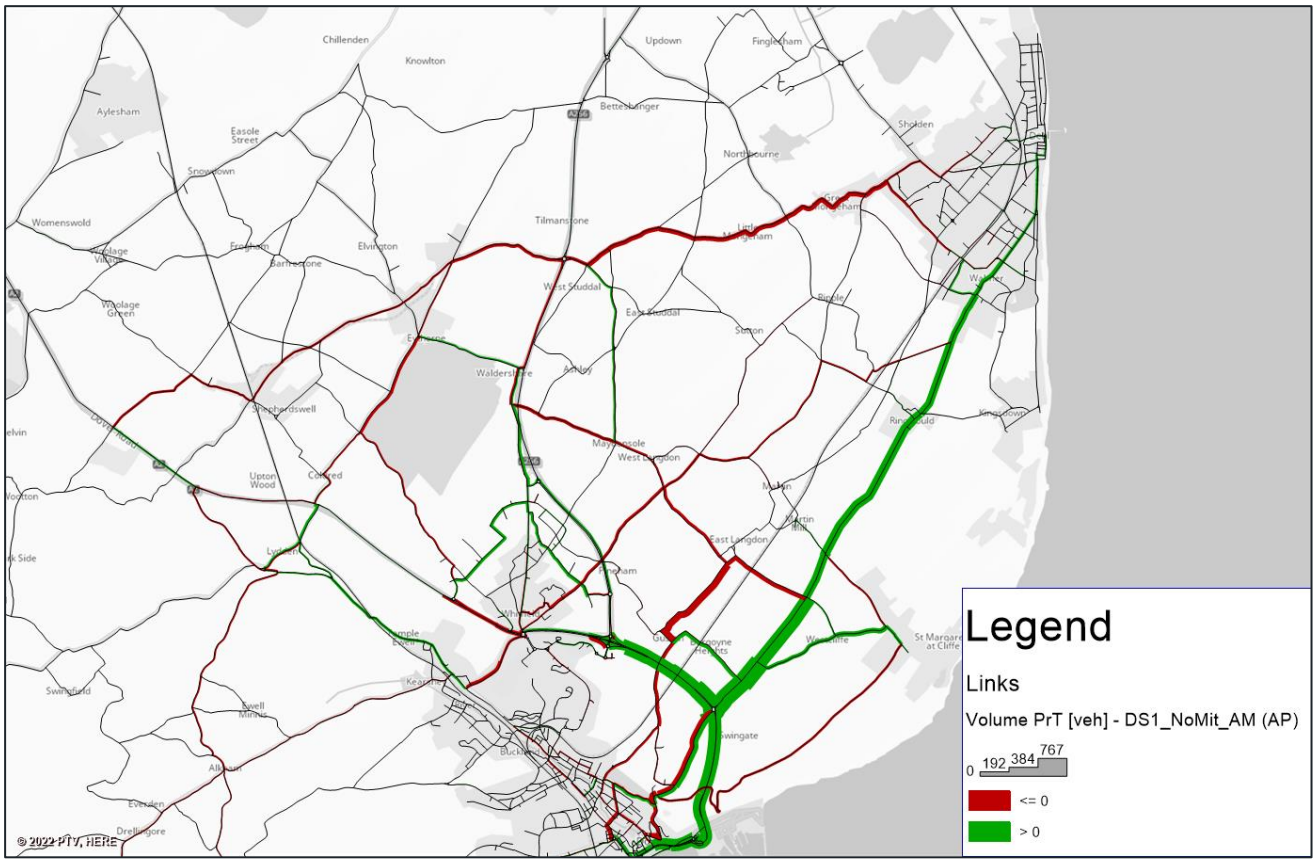


Figure 6-112: DDTM 2040 Do Something 1 With Mitigation - Do something 1 No Mitigation, AM Peak

6.11.3. Figure 6-113 shows that in the PM peak of the DS1 scenario, the junction improvements have moved traffic onto the strategic road network away from the rural roads which it as previously using. This is particularly occurring around the Duke of York roundabout where there are increases on all arms apart from the southwestern approach, along with decreases on some of the smaller surrounding roads such as Dover Road, Hangman's Lane and also Willow Woods Road going eastbound towards Deal. Flows around Whitfield roundabout do not change much with some increases and decreases on approach roads. There are some reductions in flows on the Whitfield Hill and A2 Eastbound approaches to the Whitfield roundabout however changes around this junction are small.

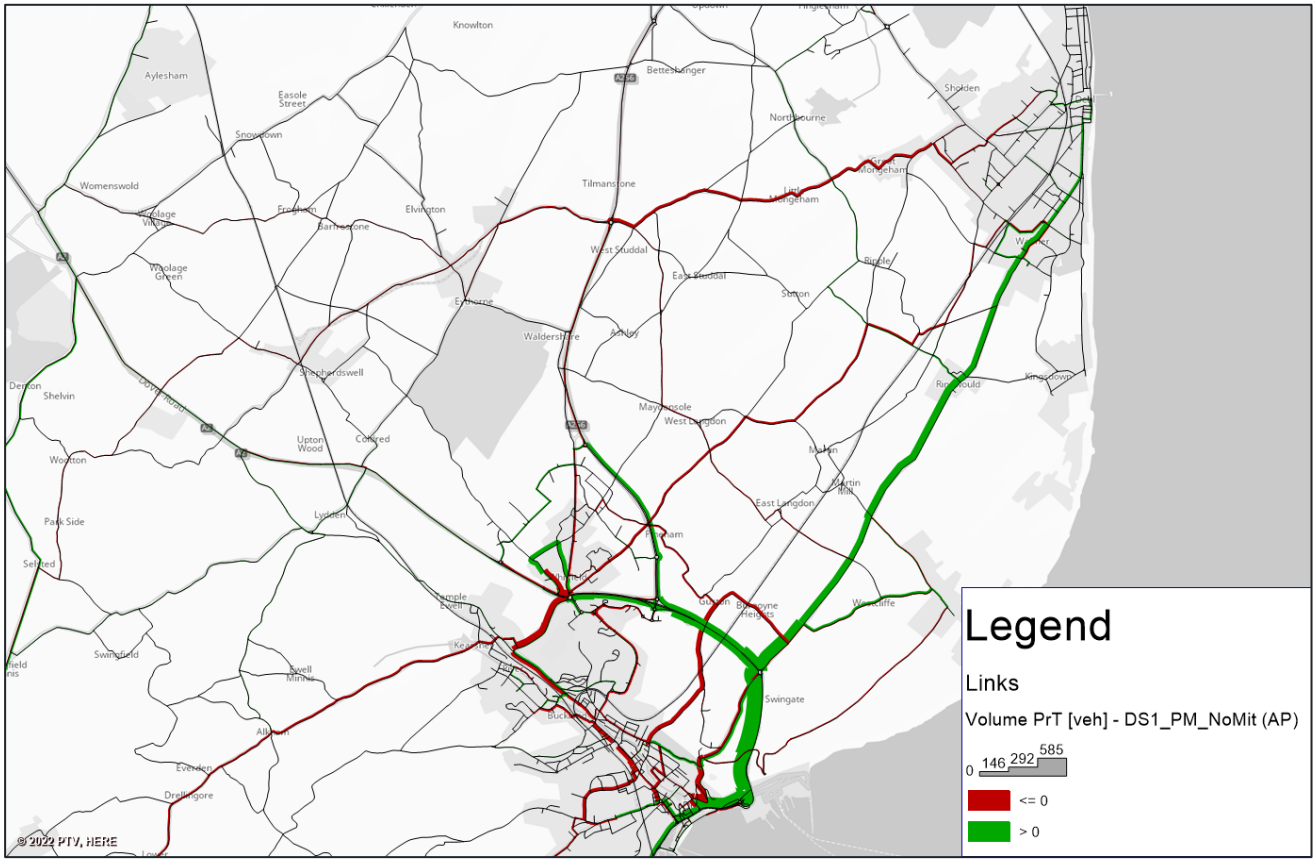


Figure 6-113: DDTM 2040 Do Something 1 With Mitigation - Do something 1 No Mitigation, PM Peak

6.12 Do Something 2 with Mitigation vs Do Something 2 No Mitigation

6.12.1. To understand the impacts of the mitigation measures at the Whitfield and Duke of York roundabouts in the Do Something 2 scenario, flow difference plots have been produced comparing scenarios with and without the changes in the AM and PM peaks.

6.12.2. Figure 6-114 shows that the impacts of the junction improvements and mitigation measures in the DS2 scenario follow the similar patterns as those seen in the DS1 scenario for the AM peak period, with the only noticeable difference being that there is no reduction in flows on the A2 Eastbound and Whitfield Hill approaches of the Whitfield roundabout.

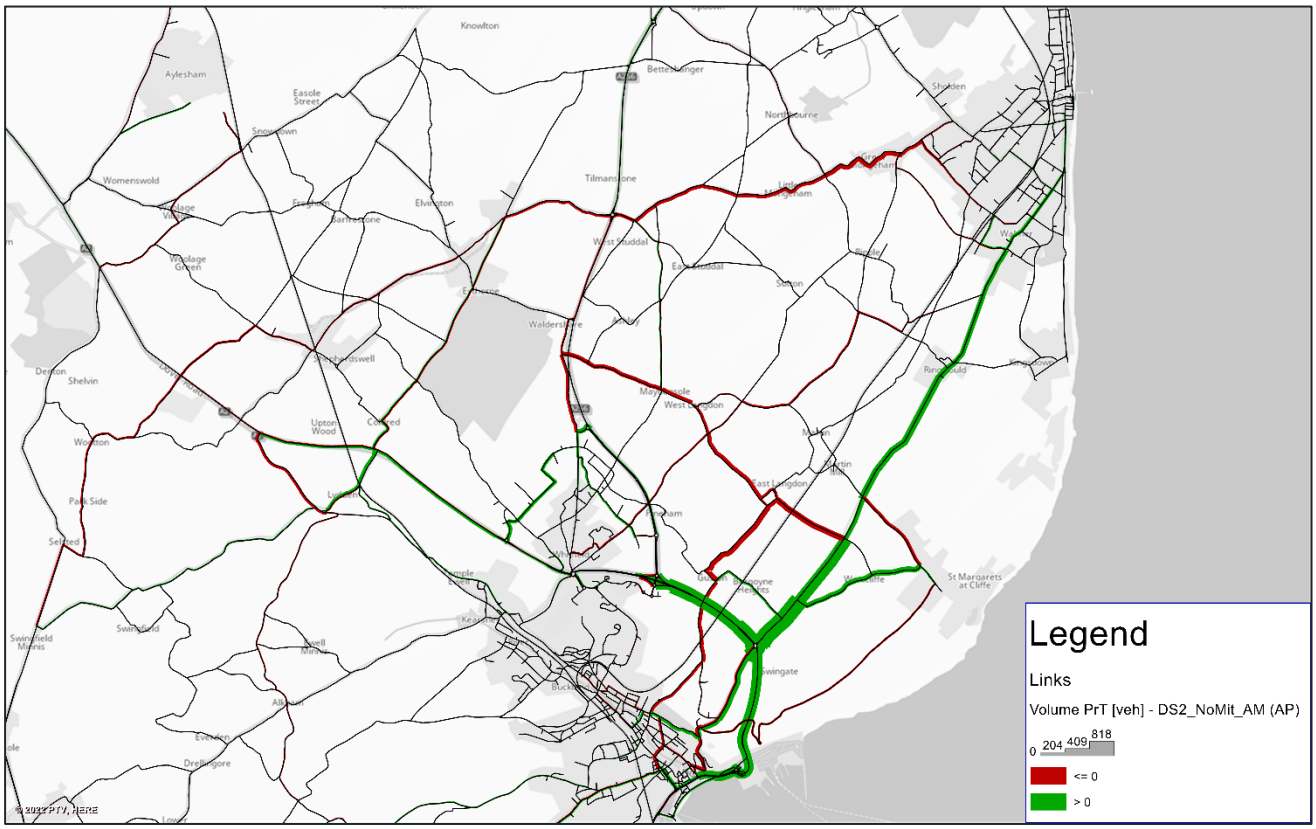


Figure 6-114: DDTM 2040 Do Something 2 With Mitigation - Do something 2 No Mitigation, AM Peak

6.12.3. Figure 6-115 shows that in the PM peak of the DS2 scenario, the re-routing around the Duke of York roundabout is similar to that seen in DS1 in light of the junction improvements, however at the Whitfield roundabout there are decreases in flow on the A2 Westbound exit larger than those seen in the DS1 scenario. It should also be noted that the junction improvements have triggered an increase in flow going southbound on the A256 instead of using the Sandwich Road in the DS2 scenario.

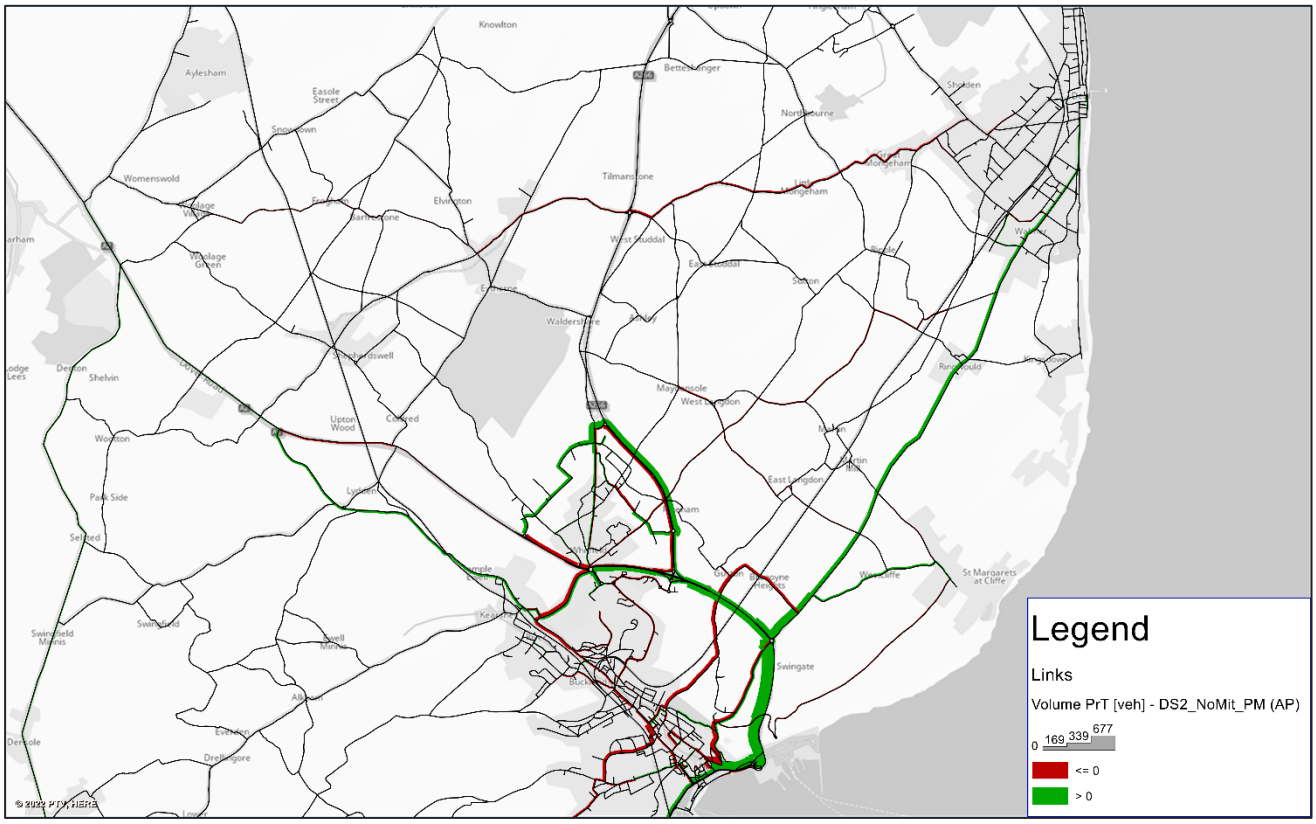


Figure 6-115: DDTM 2040 Do Something 2 With Mitigation - Do something 2 No Mitigation, PM Peak

7

SENSITIVITY TESTS

PUBLIC

7 Sensitivity Tests

7.1 Introduction

7.1.1. DDC requested WSP to undertake a Fastrack sensitivity test to understand the impacts of the proposals on traffic flows and junction performance.

7.2 Fastrack Assessment

7.2.1. Dover Fastrack received planning permission (ref KCC/DO/0178/2020) and as such DDC have asked WSP to consider a 2040 forecast scenario that incorporates a level of modal shift.

7.2.2. It is considered that the delivery of large residential developments such as Connaught Barracks and Whitfield Urban Expansion and their impact on the highway network will be dependent on the delivery of the Dover Fastrack.

7.2.3. The Transport Statement submitted as part of the application detailed the provision of 8 services in the peak hour, 4 in each direction. WSP developed a 2040 Do Something 2 model that incorporates the Dover Fastrack infrastructure proposals and will assume that the 4 buses each hour equates to 1 bus every 15 mins, in each direction.

7.2.4. Figure 7-1 presents the DDTM model zones that the proposed Fastrack alignment passes through, or bus stops are proposed to be located close to; this notably includes Connaught Barracks, White Cliffs Business Park and Whitfield Urban Expansion.

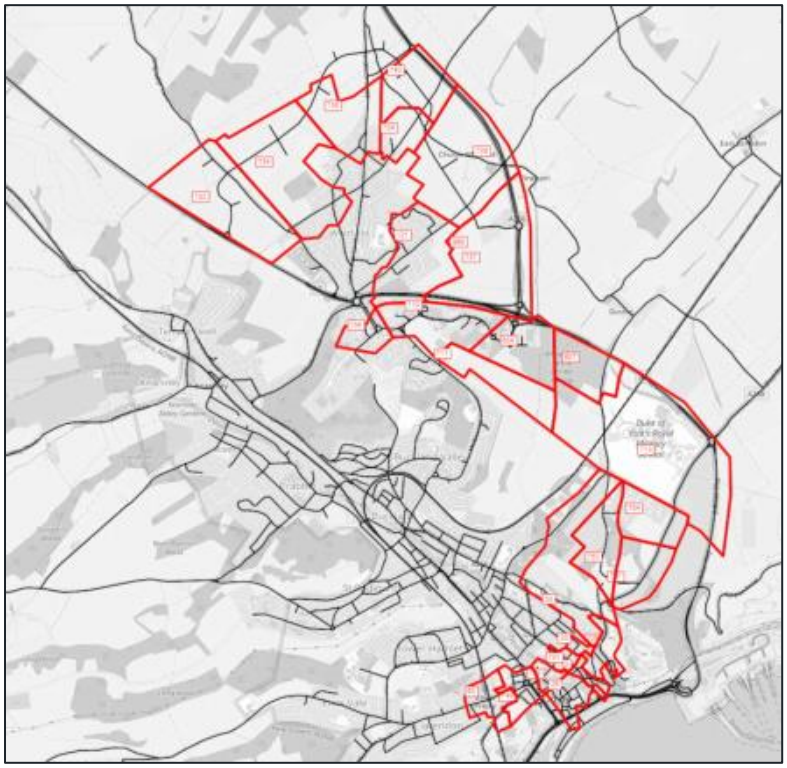


Figure 7-1: Zones used for Fastrack Analysis

7.2.5. The existing car trips routing between the zones that the Fastrack route follows are illustrated in Figure 7-2 and Figure 7-3 for the AM and PM respectively. These are the trips which could change mode from car to Fastrack in the future.



Figure 7-2: Fastrack Zones, Car Trips, AM Peak



Figure 7-3: Fastrack Zones, Car Trips, PM Peak

7.2.6. To provide a high-level indication of the highway impacts of implementing Fastrack, WSP assessed three modal shift options for trips between zones shown in Figure 7-2 and Figure 7-3, this is illustrated in Table 7-1.

Table 7-1: Modal Shift with the Implementation of Fastrack

	AM Peak (vehicles)		PM Peak (vehicles)	
	DS1	DS2	DS1	DS2
10%	92	118	95	124
20%	185	235	191	249
30%	277	353	286	373

7.2.7. After discussions between DDC, KCC and WSP it was agreed that a 10% take up of the Fastrack was most probable and as such a VISUM model incorporating these changes was developed for the DS2 scenario.

7.2.8. Flow difference plots showing the change in traffic behaviours as a result of the Fastrack in the DS2 scenario are detailed in Figure 7-4 for the AM peak. This analysis presents reductions of traffic on the network surrounding Whitfield, Connaught Barracks and Dover town centre. Some increases due to localised rerouting occurs on the A2 east of Whitfield and on the A258 southbound approach to the Duke of York.

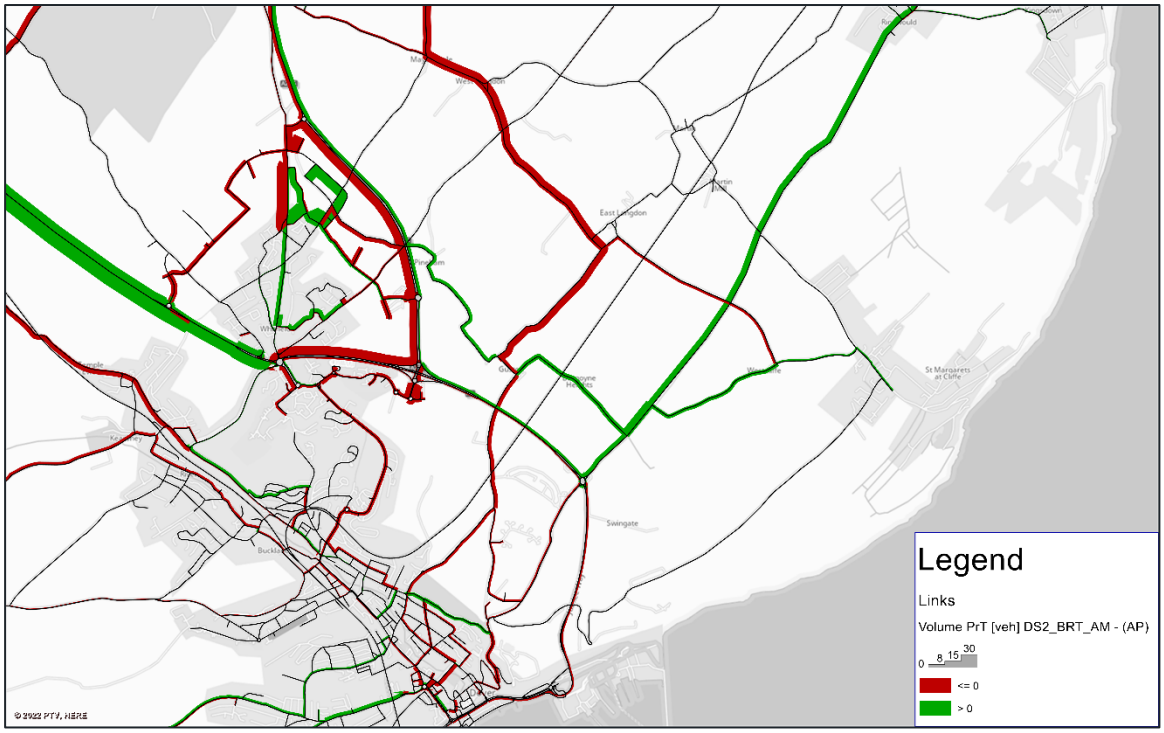


Figure 7-4: Difference in Flows between DS2 Fastrack and DS2, AM Peak

7.2.9. Figure 7-5 presents the change in flow on the network as a result of the Fastrack in the PM peak. There is decreased flow seen to use the A256 northbound, A2 southbound and A258 northbound. Increased flow is presented on Melbourne Avenue, however the increased flow originates from areas that is not served by the Fastrack.

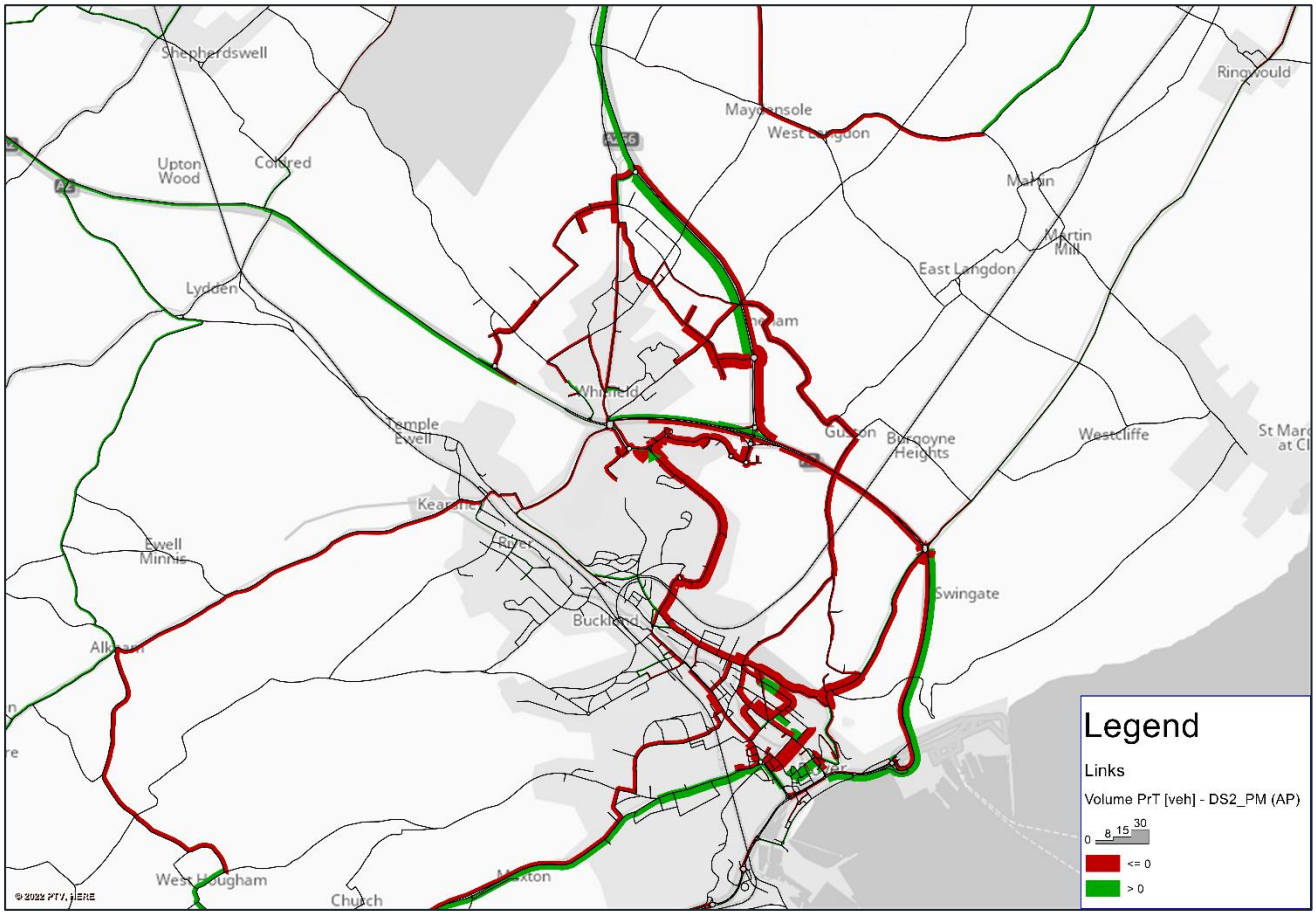


Figure 7-5: Difference in Flows between DS2 Fastrack and DS2, PM Peak

7.2.10. KCC provided WSP initial proposed Fastrack bus stop locations and as such there were some additional zones identified that could use the Fastrack, the difference between these flows are shown in Table 7-2.

Table 7-2: Difference between KCC uptake in Fastrack compared with Modal Shift Assessed

Difference:				
	AM Peak (vehicles)		**PM Peak (vehicles)**	
	DS1	**DS2**	**DS1**	**DS2**
10%	27	33	50	55
20%	55	67	100	109

Difference:				
	AM Peak (vehicles)		PM Peak (vehicles)	
	DS1	DS2	DS1	DS2
30%	82	100	151	164

7.2.11. The modal shift with the inclusion of the additional zones was a difference of up to 55 trips in the DS2 scenario with the 10% modal shift assumed, as this was deemed negligible it was decided with DDC that the analysis with the zones illustrated in Figure 7-1 was sufficient.

V/C Analysis

7.2.12. Using the same methodology discussed in Section 6.10, the volume of capacity performance with Fastrack in operation in the DS2 scenario was undertaken.

7.2.13. This analysis found that the implementation of Fastrack does help to reduce the traffic volumes along the proposed route which results in some reductions in V/C. It is also likely that our approach to identifying trips is underestimating the numbers which would use Fastrack as it assumes the trip patterns remain the same as the base year, however with Whitfield and White Cliff's Business Park developments in the future it is likely that there will be increased trip movements along the Fastrack corridor. A table comparing the V/C values with and without the implementation of the Fastrack is displayed in Table 7-3. If there is an exceedance of 85% the text is coloured orange, if the performance is over 100% the text is coloured red.

Table 7-3: V/C Links and Nodes Summary, Do Something 2 without Fastrack vs Do Something 2 with Fastrack

Network Location within DDTM Study Area		Do Something 2		Do Something 2 Fastrack		Difference	
		AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
Node	Whitfield roundabout, A2 West Approach	100	94	99	94	-1	0
	Whitfield roundabout, Whitfield Hill Approach	102	107	102	106	0	-1
	Whitfield roundabout, Sandwich Road Approach	112	95	114	95	2	0
	Whitfield roundabout, A2 East Approach	91	98	90	97	-1	-1
	Whitfield roundabout, Honeywood Road Approach	85	98	84	97	-1	-1
	Duke of York roundabout - A2 West Approach	95	100	96	99	1	-1
	Duke of York roundabout - A2 Jubilee Way Approach	92	97	91	96	-1	-1
	Duke of York roundabout - A258 Deal Road North Approach	98	62	98	62	0	0
	Duke of York roundabout - A258 Deal Road South Approach	99	108	100	105	1	-3
	A256 / A2 Northern Roundabout; Northbound Approach	55	104	55	102	0	-2
	A256 / A2 Northern Roundabout; Southbound approach	115	85	115	84	0	-1
	A2 Eastbound onslip from A256/ A2 Northern roundabout	109	91	110	90	1	-1
	A256/ A2 Southern Roundabout; Northbound Approach from Honeywood Parkway	28	86	27	85	-1	-1
	Whitfield Development Roundabout at NE of Site tying in at A256; Western Approach	81	86	81	86	0	0
	Western Approach to proposed roundabout on A2 leading to Whitfield Access Road.	56	97	56	97	0	0
	A265/ Richmond Way Roundabout, A256 Northbound Approach	61	107	61	106	0	-1
	A20 Limekiln Street/ Union Street Signalised junction	97	72	97	71	0	-1
	Castle Street/ MaisonDieu Road Signalised junction	85	84	85	84	0	0
	A20 Snargate St/ York St Signalised Junction	88	93	88	93	0	0
	A256 Maison Dieu / Park Avenue / Godwyne Road / Park Street Signalised Junction	68	86	66	86	-2	0
	London Road / Alkham Valley Road Junction	89	73	88	73	-1	0
	Dover Road/ Boys Hill Roundabout, A256 North Approach	113	65	114	65	1	0
	A256 Dover Road/ Dover Road Roundabout, A256 Dover Road NE Approach	87	51	87	51	0	0
Links	A256 Whitfield Hill Southbound from Whitfield roundabout	44	86	44	86	0	0
	A256 Whitfield Hill roundabout / London Rd roundabout; Circulatory Arm	62	94	62	94	0	0
	A258 Deal Road Southbound; Approach to DoY, north of The Lane	103	54	104	54	1	0
	A258 Dover Road Southbound; Between Station Road and Front Street	86	43	86	43	0	0
	A258 Northbound, North of Church Street Junction to Granville/ Salisbury Road	79	87	77	86	-2	-1
	Whitfield Development Road from A2 roundabout to Singledge Lane, Northbound	26	91	25	90	-1	-1
	Whitfield Development Road from Sandwich Road to A256 roundabout, Eastbound	80	94	80	93	0	-1
	Honeywood Parkway roundabout; Circulatory Arm	48	91	47	89	-1	-2
	Honeywood Parkway Westbound; west of Honeywood Close	52	87	51	86	-1	-1
	Honeywood Parkway Eastbound; between Fitness Fields and B&Q roundabout	31	89	31	88	0	-1
	A258 London Road, North of Mongeham Way Junction	94	72	94	72	0	0
	A258 London Road Northbound	97	69	97	68	0	-1
	A258 London Road/ Manor Road Roundabout; Circulatory Arm	113	80	113	80	0	0
	Northern section of London Road / Manor Road roundabout	89	87	90	87	1	0
	Castle Hill Road/ St James Street SB	61	110	60	112	-1	2
	St James Street SB	58	107	57	109	-1	2
	Dover Road Southbound, South of Hawksdown Junction	93	53	93	53	0	0
	Biggin Street Westbound between Worthington Street and Priory Street	81	104	80	100	-1	-4

Network Location within DDTM Study Area	Do Something 2		Do Something 2 Fastrack		Difference	
	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
Priory Street Southbound	73	97	72	94	-1	-3
Castle Street Westbound, South of Maison Dieu Road	86	60	85	62	-1	2
B2011 Folkestone Rd Eastbound - Approaching A256 York St/ Priory Road roundabout	92	94	90	93	-2	-1
A2 Eastbound, between link through Coldred and Coldred hill junction	74	96	74	96	0	0

8

LOCAL JUNCTION MODELS

PUBLIC

8 Local Junction Models

8.1 Introduction

8.1.1. Following a review of the highway impacts of the Do Minimum and Do Something strategic models and following conversations with DDC, KCC and NH, a more detailed junction modelling exercise has been undertaken at the following junctions to determine the impacts of the delays and operation:

- Duke of York roundabout;
- Whitfield roundabout;
- A2/A256 dumbbell roundabouts;
- London Road/ Alkham Valley Road;
- A256/ Boys Hill;
- Dover Road/ Grams Road/ Station Road;
- A256/ A258 Deal Road and
- A256 Sandwich Road Bypass / A257/ Ash Road

8.1.2. Table 8-1 summarises the V/C ratios obtained from the VISUM model for the DM, DS1 and DS2 where further junction modelling was identified. Where there were multiple entries exceeding capacity, the worst turn is taken. The two junctions on the A256 sit outside of the detailed modelled area but were previously identified as problematic in the future from the Local Plan Regulation 18 work undertaken.

Table 8-1: Junctions exceeding Capacity in VISUM Model assessed in further detail

Junction	DM		DS1		DS2		Comment
	AM	PM	AM	PM	AM	PM	
Duke of York Roundabout	105	105	101	109	99	108	Junction modelling undertaken and agreed with KCC/ NH
Whitfield Roundabout	103	103	116	105	112	107	Junction modelling undertaken and agreed with KCC/ NH
A2/ A256 Interchange	85	60	114	100	115	104	Junction modelling verbally agreed. WSP shared with KCC/NH. Received NH comments on 6th October and modelling presented includes NH comments.
London Road/ Alkham Valley Road	59	61	86	61	89	73	Junction modelling undertaken
A256/ Boys Hill	95	62	107	63	113	65	Junction modelling undertaken and verbally agreed with KCC
Dover Road/ Grams Road/ Station Road	19	6	61	9	72	12	VISUM is underrepresenting flows using the junction. WSP have undertaken junction modelling.

MODELLING SOFTWARE

8.1.3. To understand the junction capacity and delays, specific junction modelling software was used, this includes TRL's Junctions 10 for priority junctions and roundabouts and TRANSYT for signalised junctions.

8.1.4. The maximum reserved capacity (RFC) produced by Junctions 10 and DoS from TRANSYT allow for comparisons between the two junctions performance.

8.1.5. The capabilities and inputs used in the junction software are outlined below.

Junctions 10

8.1.6. TRL's Junctions 10 software determines the level of queueing and RFC for each approach based on specific junction geometry and flow volumes, including the % of HGVs.

8.1.7. The models are developed based upon scaled CAD layouts of the junctions, where detailed junction geometries, including lane and entry widths, turning radii and intercept points, are input to help determine driving behaviour.

TRANSYT

8.1.8. TRANSYT is an industry standard computer programme that can model signalised junctions and networks, including roundabouts. The network layout is encoded into TRANSYT, together with signal parameters and traffic turning movements. For a given cycle time, it adjusts signal green times, and offsets between signalled nodes, to arrive at optimum signal settings to minimise vehicle stops and delays on the network.

8.1.9. Weightings can also be used to 'bias' TRANSYT towards a desired outcome. For example, queue limit weightings can be applied to roundabout circulatory lanes with restricted queuing space, to keep queue lengths within the available stacking room.

8.1.10. TRANSYT can also model give-way entries into a network.

- A Degree of Saturation (DoS) is obtained from TRANSYT and is similar to that of an RFC obtained in Junctions 10. A DoS value of 90% means that the lane is operating at capacity. This is the normally used threshold, above which the risk of longer queues and delays tends to increase. At 100% it is said to be saturated, whilst a DoS value above 100% indicates that demand is higher than capacity, and the lane is said to be over-saturated. In over-saturated conditions, queues and delays will increase over the modelled period.

Linsig

8.1.11. Linsig is an industry standard computer programme specialising in the modelling of signalised junctions and networks. The operation is similar to that of TRANSYT, involving developing a model using network layout coding, along with signal parameters and traffic turning movements to derive capacity and junction performance statistics.

8.1.12. Based on the signal cycle time, signal timings can be changed either automatically or manually to optimise and balance the performance of the junction to minimise delays on a network or at an individual junction.

8.1.13. Linsig also models giveway arms and junctions, providing similar results to the above.

8.1.14. The Degree of Saturation (DoS) measure obtained from TRANSYT is also the predominant metric used to ascertain junction and approach capacities in Linsig. It is generally considered that any lane / approach with a DoS of between 90-100% is approaching capacity, whilst in excess of 100% results in this being over-capacity, with each additional vehicle over this value adding to delays and queue lengths.

WHITFIELD ROUNDABOUT

Base Year Flows

8.1.15. WSP commissioned Traffic Survey Partners (TSP).to undertake a Manual Classified Count (MCC) survey at the same time as the Duke of York flows in November 2017. Data was obtained for the AM (08:00 – 09:00) and PM (17:00 – 18:00) peak hour; aligning with those peak hours assessed in the strategic VISUM model, the Dover and Deal Transport Model (DDTM).

Future Year Flows

8.1.16. To obtain the 2040 future year flows for the junction, the 2015 and 2040 Dover and Deal Transport Model (DDTM) was used to understand the changes in flows which occur in the future by link. The approach is outlined below:

1. Link flows on approach arms to the junction were obtained from 2015 DDTM
2. Link flows on approach arms to the junction were obtained for the 2040 DM/DS DDTM
3. The absolute difference of link flows was calculated between the 2015 DDTM and 2040 DS2 DDTM
4. Link flow difference between the 2015 and 2040 strategic models were pro-rated to obtain a 23-year growth difference to understand the change between observed 2017 counts and 2040
5. Turning proportion information from the 2017 MCC observed data was applied to the difference in link flows (growth between 2017-2040)
6. The growth between the 2017 and 2040 forecast models was added to the observed 2017 MCC data to understand the future year traffic flows at the junction.

Junction Modelling

8.1.17. The Whitfield roundabout in the 2040 Do Minimum assumes that there are fewer than 800 houses at Whitfield Phase 1 and as such the improvements at the junction are not built, and the junction remains a priority-controlled roundabout. The junction performance in the DM is therefore assessed using TRL's Junctions 10 software.

8.1.18. The 2040 DM results in Table 8-2 show that Honeywood Road and A256 Whitfield Hill approaches exceed capacity in the AM and PM peak. The A2 West approach nears theoretical capacity with an RFC of 0.99 and 0.93 in the AM and PM.

Table 8-2: 2040 Do Minimum Junction Modelling Results

Arm	AM Peak			PM Peak		
	RFC	Queues	Delays (s/PCU)	RFC	Queues	Delays (s/PCU)
A2 West	0.99	24	65	0.93	12	38
Sandwich Rd	0.82	4	24	0.46	1	7
A2 East	0.70	3	8	0.63	2	6
Honeywood Rd	1.05	36	122	1.15	87	229
A256 Whitfield Hill	1.26	98	406	1.55	283	1153
Total Queues (PCUs)		165			384	
Total Delays (PCU-hr/hr)			117			323

8.1.19. As the mitigation assume a signalised roundabout alignment the junction performance in the DS is assessed using TRL's TRANSYT 16 software.

8.1.20. To enable comparisons between the Do Minimum and Do Something scenarios, TRANSYT DoS (%) has been obtained, this is similar to Junctions 10 RFC values and displays the junction's theoretical capacity. The DS1 and DS2 results are shown in Table 8-3 and Table 8-4 and to aid comparison between RFC and DoS values, if there is an improvement in the DS compared to DM the value is shaded in green, if not the value is red.

Table 8-3: 2040 Do Something 1 Junction Modelling Results

Arm	AM Peak			PM Peak		
	Transyt DoS (%)	Transyt Queues (PCU)	Transyt Delays (s/PCU)	Transyt DoS (%)	Transyt Queues (PCU)	Transyt Delays (s/PCU)
A2 West	100	21	91	103	23	120
Sandwich Rd	69	2	13	44	1	4
A2 East	96	12	71	77	6	23
Honeywood Rd	87	7	41	88	7	47
A256 Whitfield Hill	99	12	78	146	202	683
Total Queues (PCUs)		54			239	
Total Delays (PCU-hr/hr)			99			268

8.1.21. Table 8-3 shows improvements on Sandwich Road, Honeywood Road and A256 Whitfield Hill approaches; with queues on these approaches of 13 or less in the AM peak. Similar trends are evident in the PM, however the A256 Whitfield Hill approach arm exceeds

capacity with a DoS value of 146, however this is a reduction when compared with the DM scenario.

8.1.22. The A2 approach arms deteriorate in the AM and PM peaks when compared with the DM; given these approaches are those with the dominant flow, a signalisation at a roundabout is likely to have this impact.

8.1.23. The total junction queues and delays reduce in both the AM and PM (111 PCUs and 18 PCU-hr/hr in respectively in the AM and 145 PCUs and 55 PCU-hr respectively in the PM), this design allows the Local Plan growth at nil detriment to the junction.

8.1.24. The same analysis was undertaken to understand junction performance in the DS2 scenario, this considers the 4,930 dwellings at Whitfield; these results show similar trends to those in the DS1 and are presented in Table 8-4.

Table 8-4: 2040 Do Something 2 Junction Modelling Results

Arm	AM Peak			PM Peak		
	Transyt DoS (%)	Transyt Queues (PCU)	Transyt Delays (s/PCU)	Transyt DoS (%)	Transyt Queues (PCU)	Transyt Delays (s/PCU)
A2 West	100	21	91	94	13	52
Sandwich Rd	69	2	13	46	1	5
A2 East	98	13	79	78	6	24
Honeywood Rd	89	8	44	84	6	41
A256 Whitfield Hill	83	7	49	160	223	790
Total Queues (PCUs)		44			249	
Total Delays (PCU-hr/hr)			97			266

8.1.25. Similar to the DS1, improvements in total junction queues of 121 PCUs and 135 PCUs are seen in the AM and PM Peak respectively. The A2 approach arms are seen to deteriorate slightly compared to the Do Minimum, however these approaches were nearing capacity in the DM.

8.1.26. Delays of 790 s/PCU are presented on the A256 Whitfield Hill approach in the PM, however these delays are lower than the DM which had 1,153 s/PCU.

8.1.27. It is important to note that Transyt assumes fixed signal timings for the peak hour and depending on the timings used the results can be affected, to demonstrate this an alternative signal timing were used within the Transyt which provide alternative results using the same traffic flows, in reality, throughout the peak hour the signalling infrastructure that will be implemented will have the ability to adjust the green time available for traffic depending on traffic demand.

8.1.28. To enable the Local Plan development, mitigation is needed at Whitfield roundabout to improve its performance. The Transyt modelling completed using the traffic flows from the DDTM, demonstrates the signalised junction improvement does enable the Local Plan development to come forward and improve the operation at Whitfield roundabout. This work has been reviewed and agreed with NH and KCC.

8.1.29. The junction modelling and highway design work for the Whitfield roundabout agreed with NH and KCC can be found in Appendix B, in separate document.

DUKE OF YORK ROUNDABOUT

8.1.30. The Duke of York improvements outlined in paragraph 3.4.5 were assessed and agreed with NH and KCC. The junction modelling note for this work is in Appendix C, in separate document, and a trigger point assessment to understand when rat running increases, causing a safety concern at the junction is detailed in Appendix N, in separate document.

Base Year Flows

8.1.31. The Duke of York roundabout Base Year was developed using November 2017 manual classified counts that were undertaken by Traffic Survey Partners (TSP). The information obtained included observed traffic volumes, queue lengths and driver behaviour on each approach.

Future Year Flows

8.1.32. The 2040 future year flows used in the junction models were calculated using the same approach as the Whitfield roundabout.

Junction Modelling

8.1.33. The DoY in the 2040 Do Minimum assumes that the junction improvements are not built, as such the junction remains a priority-controlled roundabout. The junction performance in the Base and DM is assessed using TRL's Junctions 10 software.

8.1.34. The Base Year performance is presented in Table 8-5, this shows that all approaches operate within theoretical capacity in the AM and PM Peak. All arms have an RFC of 0.79 and queues of 4 PCUs or less, with exception of the A258 Deal Road approach arm that nears capacity with an RFC of 0.92 and queues of 10 PCUs during the AM.

8.1.35. The PM peak show that all arms operate within capacity with RFC of 0.58 and queues of 2 PCUs or less.

Table 8-5: Duke of York Roundabout Performance, 2017 Base Year

Arm	AM Peak		PM Peak	
	RFC	Queue (PCU)	RFC	Queue (PCU)
A258 Deal Road	0.92	10	0.32	1
A2 East	0.43	1	0.50	2
A258 Castle Hill Road	0.47	1	0.58	2
A2 West	0.79	4	0.54	2
Total Queues (PCUs)		16		7

8.1.36. Junction modelling results for the 2040 DM are shown in Table 8-6. The A258 Deal Road approach deteriorates in the AM, now exceeding capacity with an RFC of 1.07 and an additional 41 PCUs of queues. The A258 Castle Hill Road and A2 west near capacity with an RFC of 0.9 and 0.95, queues begin to form on both approaches.

8.1.37. During the PM peak all arms are within capacity with the exception of the A2 west, this exceeds capacity with an RFC of 1.03 and an additional 42 PCUs of queue. Increases of queues of similar magnitude are seen on the A258 Deal Road in the AM and A2 west in the PM, this is likely attributed to by the additional committed housing in Deal.

Table 8-6: Duke of York Roundabout Performance, 2040 DM

Arm	AM Peak			PM Peak		
	RFC	Queue (PCU)	Delays (s/PCU)	RFC	Queue (PCU)	Delays (s/PCU)
A258 Deal Road	1.07	50.4	128.94	0.61	1.6	6.84
A2 East	0.45	1	3.86	0.58	1.5	4.38
A258 Castle Hill Road	0.9	8.3	33.05	0.66	2	12.21
A2 West	0.95	16.6	35.32	1.03	43.7	83.56
Total Queues (PCUs)		**76.3**			**48.8**	

8.1.38. In DS2 the junction mitigation at this junction (and outlined in Figure 3-10) will be built. As the mitigation assume a signalised roundabout alignment the junction performance in the DS is assessed using TRL's TRANSYT 16 software.

8.1.39. The forecast flows for the DS2 scenario were ran through the TRANSYT and the junction was shown to perform within capacity. The full results are in Table 8-7.

8.1.40. An improvement compared with the DM is highlighted in green and a deterioration in performance is in red. The A2 east is shown to deteriorate in the AM and PM peak, however the approach performs within capacity.

Table 8-7: Duke of York Roundabout Performance, 2040 DS2

Arm	AM Peak			PM Peak		
	DoS	MMQ (PCU)	Delays (s/PCU)	DoS	MMQ (PCU)	Delays (s/PCU)
A258 Deal Road	85	10	29	60	5	16
A2 East	67	4	23	82	8	23
A258 Castle Hill Road	72	3	10	49	2	4
A2 West	74	7	16	83	8	23
Total Queues (PCUs)		**24**			**23**	

8.1.41. The junction modelling and results of junction performance that was agreed with NH and DDC is in Appendix C, in separate document.

A2/A256 DUMBBELL ROUNDABOUT

8.1.42. The A2/ A256 junction experienced high V/C in the DS1 and DS2 strategic model, with 93% and 90% of the additional trips using the junction generated by Local Plan sites.

8.1.43. In the absence of an AutoCAD layout information, it was agreed with NH and KCC that Google satellite imagining would be used to measure the junction geometries.

Input Flows

8.1.44. Input flows for the junction model were taken from the DDTM VISUM model for the 2015 Base Year and 2040 Forecast Years.

Junction Modelling

8.1.45. Junction modelling at this junction was undertaken using TRL Junction 10 software, modelling and following NH comments we have incorporated the northern and southern roundabout into one junction model to understand the performance. All results present in this section incorporate all NH comments on this junction received on 6th October 2022.

8.1.46. The Base Year results are in Table 8-8, all approaches operate well within capacity with an RFC of 0.34 or less in the AM and 0.37 or less in the PM Peak. The junction is modelled to have total queues of less than 2 PCUs, with delays experienced on all approaches less than 3 s/PCU.

Table 8-8: 2015 Base Year, A2/A256 Junction Modelling Results

Junction	Arm	AM Peak			PM Peak		
		RFC	Queues	Delays (s/PCU)	RFC	Queues	Delays (s/PCU)
Northern	A256 Whitfield Bypass	0.34	0.5	2.38	0.15	0.2	1.77
	A256	0.23	0.3	2.22	0.37	06	2.64
	A2 on-slip	0.08	0.1	1.91	0.08	0.1	2.28
	Total Queues (PCUs)		0.9			0.9	
Southern	A256	0.15	0.2	2.10	0.07	0.1	1.68
	A2 On-slip	0.22	0.3	2.13	0.29	0.4	2.20
	Honeywood Parkway	0.12	0.1	2.31	0.20	0.2	2.68
	Total Queues (PCUs)		0.6			0.7	

8.1.47. Table 8-9 presents the junction, modelling results in the DM with the committed growth forecast between the Base Year. The junction will continue to operate within capacity on all approaches, the A256 Whitfield Bypass arm sees a reduction in capacity with an RFC of 0.66 with an increase of 1 PCU of queues in the AM peak. During the PM peak the largest RFC is on the A256 (0.54), this is well within capacity.

8.1.48. The junction modelling results show small changes between the Base and DM and as such a minimal impact on the network is anticipated.

Table 8-9: 2040 Do Minimum, A2/A256 Junction Modelling Results

Junction	Arm	AM Peak			PM Peak		
		RFC	Queues	Delays (s/PCU)	RFC	Queues	Delays (s/PCU)
Northern	A256 Whitfield Bypass	0.66	1.9	4.64	0.38	0.6	2.48
	A256	0.35	0.5	2.61	0.54	1.2	3.59
	A2 on-slip	0.24	0.3	2.51	0.40	0.7	3.82
	Total Queues (PCUs)		2.7			2.5	
Southern	A256	0.33	0.5	2.38	0.18	0.2	1.85
	A2 On-slip	0.40	0.7	3.17	0.42	0.7	2.90
	Honeywood Parkway	0.20	0.2	2.79	0.37	0.6	3.86
	Total Queues (PCUs)		1.4			1.5	

8.1.49. Table 8-10 presents the junction performance for the Local Plan growth assumed in DS2 with mitigation. The junction will continue to operate within capacity on all approaches during the AM peak, with the highest RFC being 0.88 in the AM peak on A256 Whitfield Bypass. During the PM peak the Honeywood Parkway approach exceeds capacity with an RFC of 1.06, this is due to the additional employment provided at White Cliffs Business Park generating additional pressures on the network. This results in queues of up to 54 PCUs and delays of approximately 2 minutes on this arm.

Table 8-10: 2040 Do Something 2, A2/A256 Junction Modelling Results

Junction	Arm	AM Peak			PM Peak		
		RFC	Queues	Delays (s/PCU)	RFC	Queues	Delays (s/PCU)
Northern	A256 Whitfield Bypass	0.88	6.7	13.96	0.63	1.7	4.52
	A256	0.50	1.0	3.33	0.91	8.6	16.40
	A2 on-slip	0.46	0.8	3.97	0.41	0.7	5.91
	Total Queues (PCUs)		8.5			11.0	
Southern	A256	0.39	0.6	2.70	0.21	0.3	1.92
	A2 On-slip	0.65	1.8	5.70	0.64	1.8	4.81
	Honeywood Parkway	0.30	0.4	3.27	1.06	53.6	123.13
	Total Queues (PCUs)		2.8			55.7	

8.1.50. The junction modelling results shows that the junction performs within capacity with the exception of the Honeywood Parkway arm in the PM peak. This is a result of the development proposed at the White Cliffs Business Park. These results have been generated following NH written comments received on 6th October 2022.

8.1.51. A merge diverge assessment was undertaken to understand the flow behaviour in the wider context of this junction, this highlighted that all merges and diverges would perform with the current junction alignment. This is presented further in the National Highways Comments note in Appendix M, in separate document.

LONDON ROAD/ ALKHAM VALLEY ROAD

Input Flows

8.1.52. Input flows for the junction model were taken from the DDTM VISUM model for the 2015 Base Year and 2040 Forecast Years due to the absence of observed counts.

Junction Modelling

8.1.53. As the junction is a staggered priority junction the performance was undertaken in TRL's Junction 10 software.

8.1.54. WSP have also considered possible improvements which could be adopted at this junction. One such improvement was to understand the impact that an improved safety and visibility scheme would have at the junction. The improvements considered the proposed kerb build out on Alkham Valley Road to improve visibility; these are outlined in Figure 8-1. These improvements have not been represented in any junction modelling software as the software does not have the ability to take into consideration drivers changes in behaviours as a result of the changed layout. However, from local knowledge of the operation of this junction it is believed that this layout change would encourage traffic turning left from London Road to Alkham Valley Road to signal and reduce speed earlier,therefore making it easier for traffic turning from Alkham Valley Road to London Road to get out.

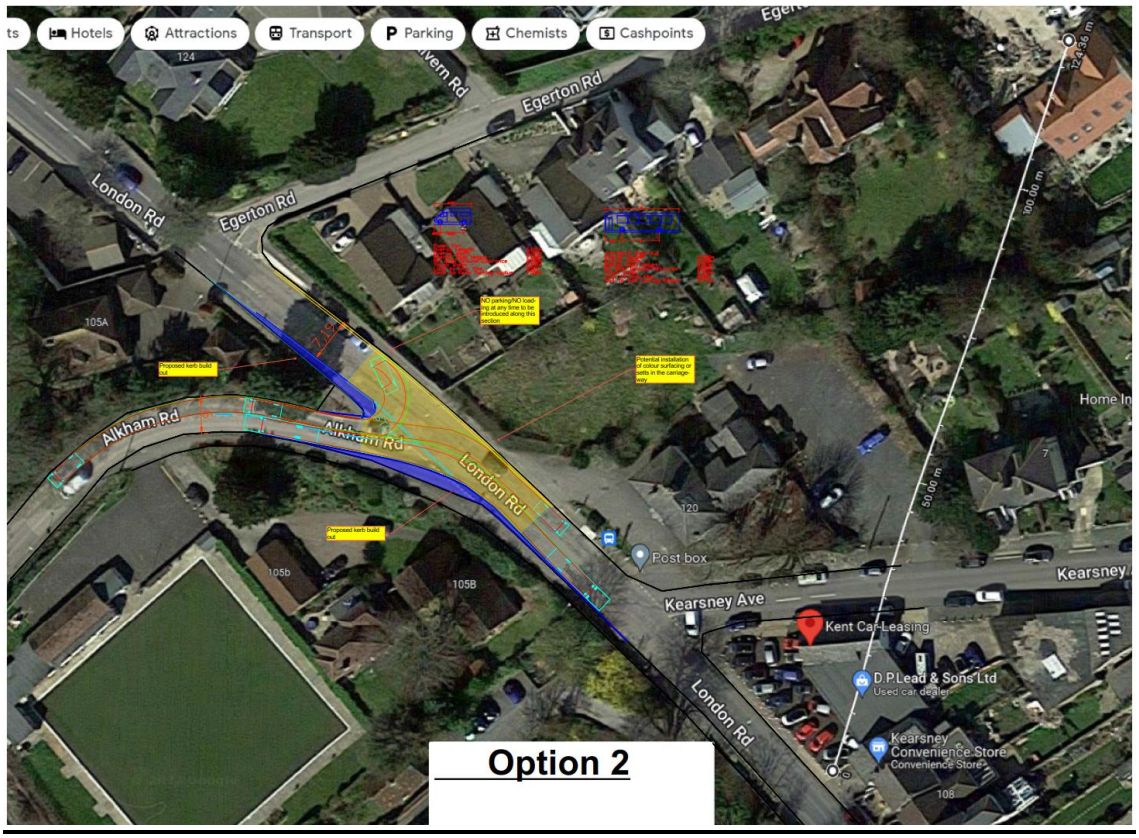


Figure 8-1: Proposed Junction Improvement at Alkham Valley Road Junction

8.1.55. Another improvement which has been considered is the signalisation of the junction and a Technical Note on the feasibility of this can be found in Appendix O, in separate document. The note provides a high level of the feasibility of introducing traffic signals at this location and the geometric review against the Design Manual Roads and Bridges (DMRB) standard CD 123 Version 2.1.0 Geometric design of at-grade signal-controlled junction. The note highlights a number of departures that may be required from guidance to enable a signal-controlled junction at this location and the mitigation measures which could be implemented to mitigate against these departures. Figure 8-2 presents a draft layout of the proposed signalised junction.

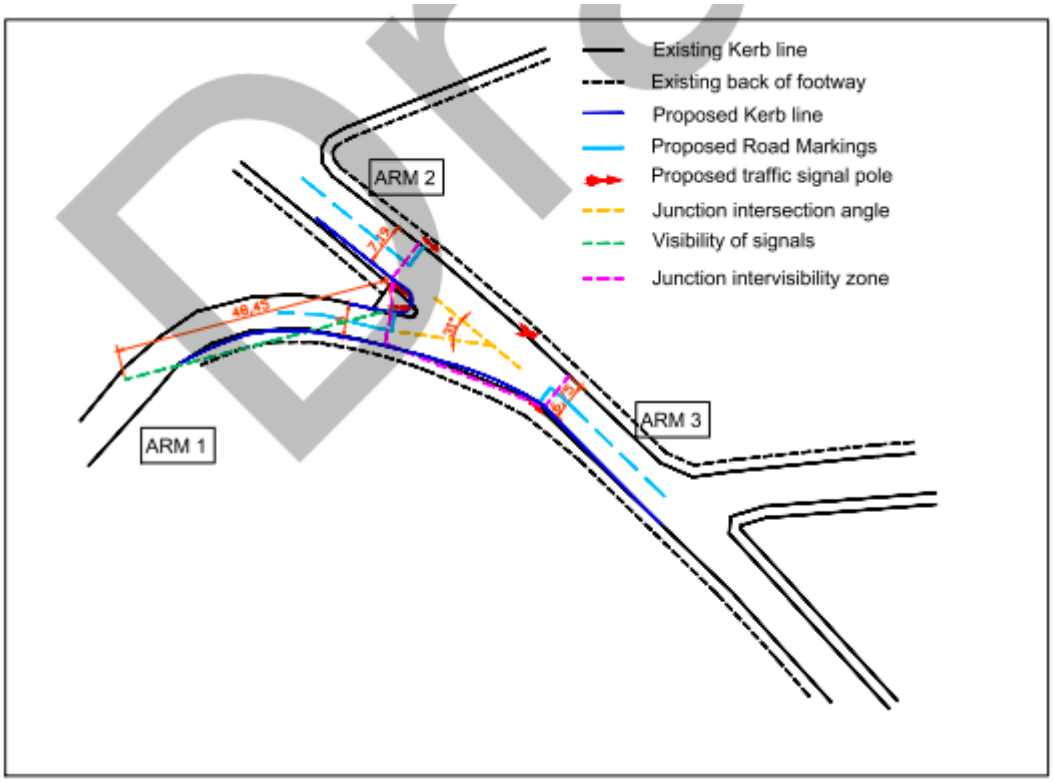


Figure 8-2: Proposed Alkham Valley/ London Road Signalised Junction Drawing

Results

8.1.56. The existing alignment of the junction illustrated that the junction is currently over capacity on the Alkham Valley Road approach in the AM and PM Peak.

8.1.57. The Alkham Valley Road had an RFC of 1.31 and 1.37 in the AM and PM peak respectively, as a result delays on this approach exceed 590 seconds in both peaks. Delays greater than 100 seconds are a safety concern as driver behaviour is likely to get more aggressive.

Table 8-11: 2015 Base, Alkham Valley Road Junction Modelling Results

Arm	AM Peak			PM Peak		
	RFC	Queues	Delays (s/PCU)	RFC	Queues	Delays (s/PCU)
Alkham Valley Road	1.31	67.3	590	1.37	91.5	758
London Road North	0.61	1.7	19	0.16	0.4	5.85
Total Queues (PCUs)		69.0			91.9	

8.1.58. Table 8-12 presents the junction modelling results for the 2040 DM, the Alkham Valley Road approach further deteriorates with an RFC of 1.55 and increased queues of 63.5 PCUs during the AM Peak.

8.1.59. Similar trends are evident in the PM peak where the Alkham Valley Road arm sees an RFC of 1.71 and an increase of queues of 116.7 PCUs. It is important to note that once the junction exceeds theoretical capacity the capacity constraints and delays grow exponentially.

Table 8-12: 2040 DM, Alkham Valley Road Junction Modelling Results

Arm	AM Peak			PM Peak		
	RFC	Queues	Delays (s/PCU)	RFC	Queues	Delays (s/PCU)
Alkham Valley Road	1.55	130.8	1134.20	1.71	208.2	1716.10
London Road North	0.67	2.4	20.41	0.20	0.5	6.25
Total Queues (PCUs)		133.2			208.7	

8.1.60. Table 8-13 details the junction modelling results for the 2040 DS2, during the AM peak both the Alkham Valley Road and London Road north arm exceed capacity with an RFC of 2.34 and 1.01 respectively.

8.1.61. Delays on the Alkham Valley Road arm exceed 2000 s/PCU, however it is important to note that once the junction exceeds theoretical capacity the delays grow exponentially.

Table 8-13: 2040 DS2, Alkham Valley Road Priority Junction Modelling Results

Arm	AM Peak			PM Peak		
	RFC	Queues	Delays (s/PCU)	RFC	Queues	Delays (s/PCU)
Alkham Valley Road	2.34	262.4	2642.97	2.16	309.3	2827.11
London Road North	1.01	26.6	109.03	0.32	1.1	6.90
Total Queues (PCUs)		289			310.4	

8.1.62. The proposed junction design presented in Figure 8-2 was assessed in the junction modelling package Linsig for the DS2 with mitigation flows. The junction performance with the signalisation, shown in Table 8-14, shows that the junction performance would improve compared to the base, DM and DS2 options as a priority junction. The queues and delays for Alkham Valley Road reduce significantly to levels of acceptable delays and queues.

Table 8-14: 2040 DS2 with Mitigation, Alkham Valley Road Signalised Junction Improvement, Modelling Results

Arm	AM Peak			PM Peak		
	DoS %	Mean Max Queue (MMQ)	Delay (s)	DoS %	Mean Max Queue MMQ	Delay (s)
London Rd NB Entry - Ahead & Left Turn	70.7%	14.9	3.7	98.6%	38.1	18.3
London Rd SB Entry - Ahead & Right Turn	108.7%	54.4	41.7	92.5%	13.2	7.5
Alkham Rd Entry- Left & Right Turn	109.6%	42.1	34.5	98.5%	25.0	15.1

8.1.63. The junction modelling suggests that in both peak hours in base and the future year without the Local Plan that there are significant queues and delays experienced on Alkham Valley Road. In the Base year 2015, the junction model is over representing the queues and delays compared to reality, which is then further exacerbated when looking at the 2040 results. Two improvement options at this junction have been considered both which provide opportunities to improve the operation of the junction. The feasibility of a signalised junction

has been considered and the junction modelling demonstrates this would improve queues and delays at the junctions compared to the base, DM and DS options with the existing priority junction.

A256/ BOYS HILL ROUNDABOUT

Input Flows

8.1.64. Input flows for the junction model were taken from the DDTM VISUM model for the 2015 Base Year and 2040 Forecast Years.

Junction Modelling

8.1.65. Junction modelling was undertaken using TRL Junction 10 software, to understand the performance at the priority-controlled roundabout.

Results

8.1.66. The junction modelling results have shown that the junction will perform within capacity in both the Base Year and the DM.

8.1.67. The results of the junction modelling are in Table 8-15 for the Base Year and total queues at the junction are 2.3 in the AM and 1.4 in the PM, these queues are minimal, and the junction models show that the junction performs well within capacity.

Table 8-15: 2015 Base, A256/ Boys Hill Roundabout, Modelling Results

Arm	AM Peak			PM Peak		
	RFC	Queues	Delays (s/PCU)	RFC	Queues	Delays (s/PCU)
A256 North	0.55	1.2	3.73	0.37	0.6	2.59
Boys Hill	0.30	0.5	5.79	0.11	0.1	3.32
A256 South	0.23	0.3	2.25	0.29	0.4	2.31
Barville Road	0.23	0.3	2.60	0.22	0.3	2.60
Total Queues (PCUs)		2.3			1.4	

8.1.68. Similarly in the DM, shown in Table 8-16 highlight that the junction will perform well within theoretical capacity, where all arms have an RFC of 0.8 or less. Total junction queues are 7 PCUs in the AM, this is an increase of 5 PCUs compared to the Base, this is less than an average on 1 PCU every 10 minutes and as such will have minor impacts on the network.

Table 8-16: 2040 DM, A256/ Boys Hill Roundabout, Modelling Results

Arm	AM Peak			PM Peak		
	RFC	Queues	Delays (s/PCU)	RFC	Queues	Delays (s/PCU)
A256 North	0.78	3.6	8.01	0.49	1.0	3.58
Boys Hill	0.66	2.1	14.55	0.14	0.2	3.81
A256 South	0.38	0.6	2.84	0.44	0.8	2.90
Barville Road	0.35	0.6	3.33	0.48	0.9	4.49
Total Queues (PCUs)		6.9			2.9	

8.1.69. Table 8-17 presents the 2040 DS2 modelling results when the Local Plan growth has been considered. This shows that there will be an increase of total junction queues of 7.6 PCUs during the AM compared to the DM, with the A256 North approach nearing capacity with an RFC of 0.93 and queues of 11 PCUs where previously the approach was within capacity.

8.1.70. During the PM peak all approach arms operate well within capacity with an RFC of 0.55 of less and less than 2 PCUs of queues on all approaches.

Table 8-17: 2040 DS2 with Mitigation, A256/ Boys Hill Roundabout, Modelling Results

Arm	AM Peak			PM Peak		
	RFC	Queues	Delays (s/PCU)	RFC	Queues	Delays (s/PCU)
A256 North	0.93	11.0	23.06	0.52	1.1	3.75
Boys Hill	0.55	1.3	10.54	0.20	0.2	3.87
A256 South	0.58	1.4	4.47	0.55	1.3	3.71
Barville Road	0.44	0.8	4.47	0.49	1.0	5.16
Total Queues (PCUs)		14.5			3.6	

8.1.71. The junction modelling shows that the A256 northern arm of the junction does deteriorate in the 2040 Do Something in the AM peak only, however the delays are not significant, 23 seconds and queues of 11 PCU's split across the two-lane approach which it is believed would not need to be mitigated against. This modelling has been agreed with KCC.

DOVER ROAD/ GRAMS ROAD/ STATION ROAD

Input Flows

8.1.72. Base year model flows were obtained from the junction turning diagram of observed 2019 flows from the Transport Assessment for the Proposed Residential Development, Cross Road, Deal (21/01822).

8.1.73. The junction turning flows do not detail the interaction between Station Road and Grams Road the observed 2014 turning movements from the Transport assessment (14/00361) was used to gain this detail.

8.1.74. To obtain the forecast flows a link growth was calculated using the methodology outlined in paragraph 8.1.16 however the growth difference was pro-rated for a 21-year growth difference to reflect the change between 2019 and 2040 flows.

Junction Modelling

8.1.75. As a staggered priority junction, the modelling was undertaken using TRL Junction 10 software, to understand the performance.

8.1.76. WSP have also considered junction improvements which could be adopted at this junction including the potential signalisation and a Technical Note on the feasibility of this can be found in Appendix O, in separate document. The note provides a high level of the feasibility of introducing a traffic signal at this location and the geometric review against the Design Manual Roads and Bridges (DMRB) standard CD 123 Version 2.1.0 Geometric design of at-grade signal-controlled junction. The note highlights a number of departures that may be required from guidance to enable a signal-controlled junction at this location and the mitigation measures which could be implemented to mitigate against these departures. Figure 8-3 presents a draft layout of the proposed signalised junction.

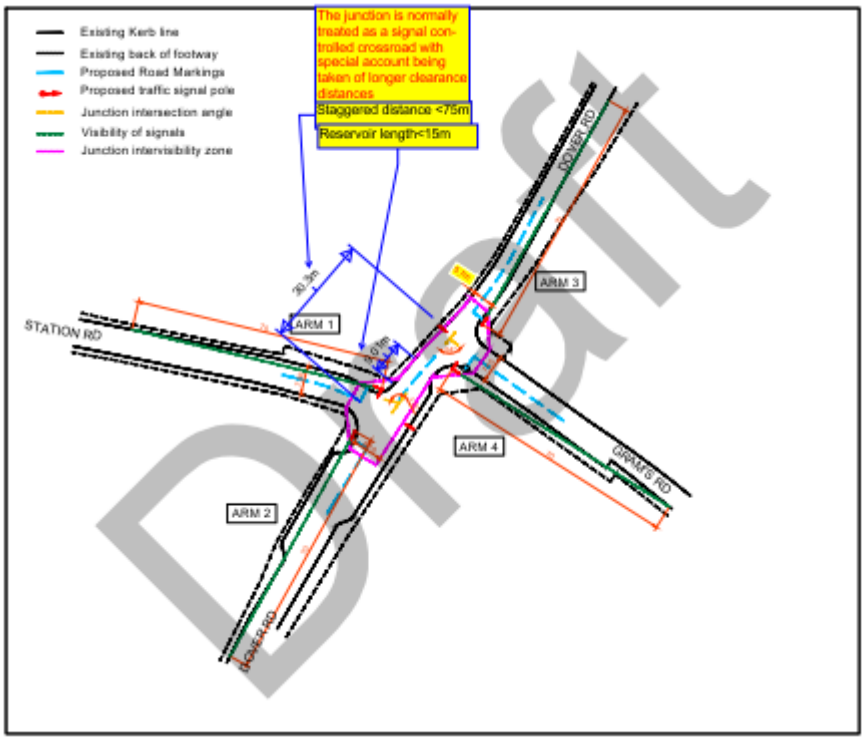


Figure 8-3: Proposed Station Road/ A258/ Grams Road Signalised Junction Drawing

Results

8.1.77. The 2019 Base Year results are in Table 8-18 and show that the junction performs within capacity on all approaches. During the AM peak, Station Road approach nears capacity with an RFC of 0.81 and delays of 61 seconds. The PM peak sees fewer delay times of 36 seconds or less.

Table 8-18: 2019 Base Year, Dover Road/ Station Road, Modelling Results

Arm	AM Peak			PM Peak		
	RFC	Queues	Delays (s/PCU)	RFC	Queues	Delays (s/PCU)
Grams Rd	0.27	0.4	14	0.13	0.1	9
Dover Rd N (RT)	0.23	0.9	4	0.22	0.7	6
Station Rd	0.81	3.7	61	0.62	1.6	36
Dover Rd (S) RT	0.14	0.4	5	0.2	0.7	4
Total Queues (PCUs)		5.4			3.1	

8.1.78. Table 8-19 presents the junction results for the 2040 DM; there are delays of 109 seconds on the Station Road approach in the AM peak, this is an increase of 48 seconds compared with the Base.

8.1.79. The total queues at the junction increase by 2 seconds in the AM peak and decrease by 1.3 seconds in the PM.

Table 8-19: 2040 Do Minimum, Dover Road/ Station Road, Priority Junction Modelling Results (Existing layout)

Arm	AM Peak			PM Peak		
	RFC	Queues	Delays (s/PCU)	RFC	Queues	Delays (s/PCU)
Grams Rd	0.5	1	18	0.21	0.3	14
Dover Rd N (RT)	0.38	2	5	0.09	0.2	5
Station Rd	0.85	4.1	109	0.3	0.4	22
Dover Rd (S) RT	0.13	0.3	5	0.27	0.9	5
Total Queues (PCUs)		7.4			1.8	

8.1.80. The results for the additional Local Plan growth modelled in DS2 with mitigation are shown in Table 8-20 this shows that the junction will deteriorate, with the largest decreases on the Station Road where the RFC is 2.6. It is important to know that once the RFC exceeds 1 the value increases exponentially, and the levels of delays should be used as indicative rather than actual values.

Table 8-20: 2040 Do Something 2 with Mitigation, Dover Road/ Station Road, Priority Junction Modelling Results (Existing layout)

Arm	AM Peak			PM Peak		
	RFC	Queues	Delays (s/PCU)	RFC	Queues	Delays (s/PCU)
Grams Rd	0.49	1	19	0.26	0.3	16
Dover Rd N (RT)	0.45	2.8	5	0.14	0.4	5
Station Rd	2.6	141	2751	0.79	3.1	84
Dover Rd (S) RT	0.2	0.7	5	0.39	1.6	5
Total Queues (PCUs)		145.5			5.4	

8.1.81. The DDTM was interrogated to understand the increases in traffic flow that occur with the Local Plan growth (without the DoY and Whitfield mitigation) and which occur as a result of the junction mitigation. This is important as the impact of the DoY improvement results in increased traffic volumes on the A258 Deal Road. Table 8-1 presents traffic flows in the 2040 AM peak DDTM models showing the increases which results from the Local Plan (DS

without mitigation compared to DM) and the increases which are a result of the DOY mitigation (DS mitigation and no mitigation). This shows that on Station Road 41% of the increase in flow is attributed to the DOY mitigation and 36% of the flow increase of A258.

Table 8-21: 2040 Increases in Traffic at Station Road/ A258/ Grams Road

	AM				
	DM	DS without Mitigation	Difference DS without mitigation and DM	DS with Mitigation	Difference DS with mitigation and no mitigation
Station Road (EB)	127	249	167	333	84
A258 North of Grams Road SB	843	877	34	944	67
A258 South of Station Road NB	783	915	132	943	28

8.1.82. The proposed junction design presented in Figure 8-3 was assessed in the junction modelling package Linsig for the DS2 with mitigation flows. The junction performance with the signalisation, shown in Table 8-22, shows that the junction performance would improve for Station Road compared to base, DM and DS2 options as a priority junction. The queues and delays for Station Road reduce significantly to levels of acceptable delays and queues. It is important to note that this junction modelling assumes the on-street parking between Station Road and Grams Road is removed to allow a right turn pocket into Station Road for vehicles travelling southbound on A258.

Table 8-22: 2040 DS2 with Mitigation, Station Road/ A258/ Grams Road Signalised Junction Improvement, Modelling Results

Arm	AM Peak			PM Peak		
	DoS %	MMQ	Delay (s)	DoS %	MMQ	Delay (s)
Station Rd Entry - Left & Right	95.9%	13.8	9.2	91.5%	6.9	5.0
Dover Rd S Entry - Ahead & Left	94.2%	29.1	12.0	96.8%	40.7	15.4
Dover Rd N (Internal) - Ahead & Give Way Right	62.2%	0.9	0.8	37.1%	0.7	0.5
Dover Rd N Entry - Ahead & Left	94.4%	28.8	12.1	51.2%	9.2	2.0
Gram's Rd Entry - Left & Right	93.5%	8.2	6.0	47.9%	2.2	1.3
Dover Rd S (Internal)- Ahead & Give way Right	79.5%	21.4	9.8	62.6%	24.3	3.2

8.1.83. Both the Station Road and Grams Road priority junctions have been modelled in a single junction model. In the 2019 base case using the counts it is suggesting the left and right turn from Station Road has the levels of delay in the AM and PM peak which equates to in the model 61 seconds in the AM peak and 36 second in the PM peak.

8.1.84. In the 2040 Do Minimum in the AM peak the Station Road delays and queues increase whereas in the PM peak there is some improvement as a result of negative growth in traffic. In the 2040 Do Something again it is the Station Road approach which deteriorates especially in the AM peak which is a result of increased flows on the A258 as a result of the improved Duke of York roundabout improvements and the Local Plan.

8.1.85. A signalised junction improvement for this junction has been considered using the junction modelling software Linsig. With the introduction of a signalised junction at this location and removal of the on-street parking there is an improvement in junction performance at Station Road providing reductions in delays and queues better than the existing base year performance. As a result of the introduction of the signalised junction there is some additional delay on A258.

A256/ A258 DEAL ROAD

Input Flows

8.1.86. As this junction lies outside the detailed model area of the DDTM the flows from the static analysis undertaken for this junction as part of Cluster 2.

Junction Modelling

8.1.87. As a priority roundabout, the modelling was undertaken using TRL Junction 10 software, to understand the performance.

Results

8.1.88. Table 8-23 presents the junction modelling results in the base year for A256/ A258 Deal Road roundabout. The results show that the junction performs within capacity in both time periods with no significant queues or delays.

Table 8-23: 2015 A256 Sandwich Bypass/A258 Deal Road

Arm	AM			PM		
	Queue (Veh)	Delay (s)	RFC	Queue (Veh)	Delay (s)	RFC
Sandwich Bypass (NW)	5.3	20.06	0.85	3.7	14.45	0.79
A258 Deal Road (E)	0.7	3.88	0.42	0.4	2.91	0.26
A256 (S)	1.5	7.85	0.61	1.2	6.29	0.55
Sandwich Wildlife Park (W)	0.0	10.54	0.01	0.0	8.47	0.00

8.1.89. Table 8-24 presents the junction performance for the 2040 DM scenario. As the table highlights in both the AM and PM peak the Sandwich Bypass arm performance deteriorates with delays increasing and the RFC is 0.96 and 0.92 in the AM and PM peak which is close to capacity.

Table 8-24: 2040 DM A256 Sandwich Bypass/A258 Deal Road

Arm	AM			PM		
	Queue (Veh)	Delay (s)	RFC	Queue (Veh)	Delay (s)	RFC
Sandwich Bypass (NW)	16.7	59.99	0.96	10.0	35.38	0.92
A258 Deal Road (E)	0.7	3.98	0.42	0.7	3.77	0.41
A256 (S)	4.5	17.14	0.82	2.1	9.37	0.68
Sandwich Wildlife Park (W)	0.0	15.26	0.01	0.0	11.44	0.01

8.1.90. Table 8-25 presents the junction performance for the 2040 DS1 with mitigation scenario. As with 2040 DM the Sandwich Bypass experiences high RFC and delays both peaks which are a similar magnitude to those experienced in the 2040 DM.

Table 8-25: 2040 DS1 with Mitigation A256 Sandwich Bypass/A258 Deal Road

Arm	AM			PM		
	Queue (Veh)	Delay (s)	RFC	Queue (Veh)	Delay (s)	RFC
Sandwich Bypass (NW)	7.6	29.02	0.89	13.9	49.05	0.95
A258 Deal Road (E)	0.7	3.87	0.42	0.8	4.03	0.45
A256 (S)	5.4	20.00	0.85	4.4	17.16	0.82
Sandwich Wildlife Park (W)	0.0	16.17	0.01	0.0	15.64	0.01

8.1.91. Overall the A256/ A258 Deal Road junction experiences delays and capacity issues in the DM and DS scenarios. The next steps for this junction will be to identify where there is a need for improvements and potential improvements options for the junction with KCC.

A256 SANDWICH ROAD BYPASS/ A257/ ASH ROAD

Input Flows

8.1.92. As this junction lies outside the detailed model area of the DDTM the flows from the static analysis undertaken for this junction as part of Cluster 3.

Junction Modelling

8.1.93. As a priority roundabout, the modelling was undertaken using TRL Junction 10 software, to understand the performance.

Results

8.1.94. Table 8-26 presents the junction modelling results in the base year for A256 Sandwich Road Bypass/ A257/ Ash Road roundabout. The results show that the junction performs within capacity in both time periods with no significant queues or delays.

Table 8-26: 2015 A256 Sandwich Road Bypass/A257/ Ash Road

Arm	AM			PM		
	Queue (Veh)	Delay (s)	RFC	Queue (Veh)	Delay (s)	RFC
Sandwich Bypass (N)	2.5	9.02	0.72	2.6	9.19	0.72
Ash Road (E)	0.4	7.02	0.27	0.2	6.50	0.19
Sandwich Bypass (S)	2.5	9.90	0.72	1.6	7.06	0.62
A257 Each End (W)	1.0	5.19	0.49	0.8	4.50	0.44

8.1.95. Table 8-27 presents the junction performance for the 2040 DM scenario. As the table highlights in both the AM and PM peak both Sandwich Bypass arms performance deteriorates with delays increasing and the RFC is over 0.97 in the AM and PM peak which is close to capacity.

Table 8-27: 2040 DM A256 Sandwich Road Bypass/A257/ Ash Road

Arm	AM			PM		
	Queue (Veh)	Delay (s)	RFC	Queue (Veh)	Delay (s)	RFC
Sandwich Bypass (N)	29.7	82.13	0.99	20.5	58.74	0.97
Ash Road (E)	0.9	13.87	0.47	0.5	11.33	0.35
Sandwich Bypass (S)	24.3	75.25	0.98	16.3	51.52	0.96
A257 Each End (W)	2.8	11.78	0.74	2.2	9.78	0.69

8.1.96. Table 8-28 presents the junction performance for the 2040 DS1 with mitigation scenario. As with 2040 DM the Sandwich Bypass arms experiences high RFC and delays in both peaks with all arms exceeding an RFC of 1 indicating they are over capacity.

Table 8-28: 2040 DS1 with Mitigation A256 Sandwich Road Bypass/A257/ Ash Road

Arm	AM			PM		
	Queue (Veh)	Delay (s)	RFC	Queue (Veh)	Delay (s)	RFC
Sandwich Bypass (N)	149.5	364.56	**1.11**	119.2	290.55	**1.08**
Ash Road (E)	1.0	15.31	**0.50**	0.6	12.83	**0.38**
Sandwich Bypass (S)	48.3	136.27	**1.02**	84.7	222.74	**1.06**
A257 Each End (W)	4.1	16.01	**0.81**	3.1	12.90	**0.76**

8.1.97. Overall the A256 Sandwich Road Bypass/A257/ Ash Road junction experiences delays and capacity issues in the DM and DS scenarios. The next steps for this junction will be to identify potential improvements for the junction with KCC.

8.2 Summary

8.2.1. The Whitfield junction mitigation was agreed with NH and KCC in May 2022 and show that the junction in the DS will have nil detriment compared to the DM. The junction therefore has the capacity for the local plan growth.

8.2.2. The mitigation at the Duke of York roundabout have been agreed with NH and KCC. This shows that the junction with the mitigation will perform within capacity and unlock capacity for additional demand. The rat-running analysis has also detailed that the mitigation reduces traffic on rural roads and increase demand on the strategic network.

8.2.3. The A2/A256 interchange was assessed using Junctions 10 modelling software and highlight that the junction will operate within capacity in all scenarios with the exception of the Honeywood Parkway arm in the PM peak DS2 with mitigation scenario. The Honeywood Parkway approach exceeds capacity in the DS2 PM peak with an RFC of 1.06 which is a result of the proposed jobs at White Cliffs Business Park. These results take into consideration NH comments received on 6th October 2022.

8.2.4. The London Road/ Alkham Valley Road junction is over capacity in the Base; however, the model is over representing the levels of delay compared to delays experienced currently at the junction, and this is further exacerbated in the future years. Two junction improvements have been identified with a signalisation of the junction modelled. Initial feasibility of a signalised junction has been undertaken and areas highlighted where it fails to meet guidance and mitigation measures have been suggested. The junction modelling of the signalised junction shows that it would improve the delays and queues experienced on the Alkham Valley Road so they were better than the base scenario.

8.2.5. A256/ Boys Hill Roundabout junction model highlighted that the A256 northern arm of the junction does deteriorate in the 2040 Do Something in the AM peak only, however the delays are not significant, 23 seconds and queues of 11 PCU's split across the two-lane approach which it is believed would not need to be mitigated. This has been agreed with KCC.

8.2.6. Dover Road/ Station Road/ Grams Road junction exceeds capacity on the Station Road approach in the Base which is further execrated in the future years as a result of additional local plan growth and the rerouting back onto the A258 Deal Road with the junction mitigations at the Duke of York Roundabout. Initial feasibility of a signalised junction has been undertaken and areas highlighted where it fails to meet guidance and mitigation measures have been suggested. The junction modelling of the signalised junction shows that it would improve the delays and queues experienced on the Station Road so they were better than the base scenario.

8.2.7. The A256/ A258 Deal Road roundabout shows that in the DM and DS there are delays on the Sandwich Bypass arm which show it is close to capacity in both the AM and PM. Next steps for this junction will be to discuss potential improvements with KCC.

8.2.8. The A256 Sandwich Road Bypass/ A257/ Ash Road roundabout shows that in the DM and DS there are delays on the Sandwich Bypass arm which show it is close to capacity in the DM and overcapacity in the DS in both the AM and PM. Next steps for this junction will be to discuss potential improvements with KCC.

8.2.9. The junction modelling outputs for these junctions can be found in Appendix P, in separate document.

9

EXTERNAL LOCAL PLAN SITES

9 External Local Plan Sites

9.1 Introduction

9.1.1. The DDTM study area, or area of detailed modelled, is shown in Figure 1-1; areas outside of this boundary have been modelled in significantly less detail, with only some roads coded in Aylesham, Eythorne, Sandwich and Alkham. The DDTM study area incorporates Dover town centre and Deal, and is bordered by the A256, Betteshanger Park, Lydden and Whitfield Urban Expansion.

9.1.2. For sites greater than 10 dwellings, but outside the DDTM study area, an excel modelling process has been undertaken to determine the likely trip distribution and possible impacts associated with including the site within the Local Plan allocations. This chapter discusses the methodology used to develop an excel model that represents the external site locations and the resulting impacts on localised junctions.

9.2 Methodology

9.2.1. To determine the localised impacts of the proposed Local Plan sites that are situated outside of the DDTM study area, flow diagrams have been developed to represent the Do Something scenario 1 and demonstrate the actual and percentage flow increases along key links and through key junctions, selected by DDC in October 2019.

9.2.2. To consider the growth between the 2019 observed data and the DM and DS forecast year data, growth and local plan trips have been assigned. The methodology behind this is outlined in 9.2.10 for the DM and 9.2.14 for the DS1.

Observed Count Data

9.2.3. WSP commissioned Intelligent Data Collection (IDC), on behalf of DDC, to undertake 14 Automatic Traffic Counts (ATCs) and 19 Manual Classified Counts (MCCs) during November/ December 2019. The counts were undertaken on key locations within areas outside of the DDTM study area to determine the likely vehicle count on specified roads and the turning counts at various junctions. A summary of the count locations, count type and data collection period is described in

9.2.4. Table 9-1 and shown in Figure 9-1, where yellow icons indicate an ATC and purple icons indicate an MCC.

9.2.5. At the time of commissioning surveys in 2019 the Church Hill / Wigmore Lane / Shepherdswell Road / Shooters Hill priority junction could not have a Manual Classified Count (MCC) survey undertaken due to the proximity of Overhead Line Equipment (OLE), to overcome this the four ATC counts were obtained on all approaches. In October 2021 there was ability to undertake MCC surveys, MCC surveys were commissioned by IDC to understand turning movements at the junction.

9.2.6. IDC undertook a 3-day Manual Classified Count Survey at the junction between Tuesday 5th October and Thursday 7th October 2021 during the hours of 07:00 – 10:00 for the AM peak and 16:00 – 19:00 for the PM Peak.

Table 9-1: 2019 Data Collection

ID	Type	Location	Data Collection Period
1	ATC	Alkham Valley Road	21/11/19 – 20/12/19
2	ATC	Alkham Road	21/11/19 – 6/12/19
6A	ATC	Deal Road	25/11/19 – 18/12/19
6B	ATC	A258 Deal Road	25/11/19 – 18/12/19
8A	ATC	B2046 High Street	26/11/19 – 19/12/19
8B	ATC	A257 Canterbury Road	2/12/19 – 16/12/19
14A	ATC	Church Hill	21/11/19 – 25/11/19
14B	ATC	Wigmore Lane	21/11/19 – 8/12/19
14C	ATC	Chapel Hill	21/11/19 – 10/12/19
14D	ATC	Shepherdswell Road	21/11/19 – 22/12/19
15A	ATC	High Street	25/11/19 – 18/12/19
15B	ATC	Church Street	25/11/19 – 18/12/19
15C	ATC	Lower Street	25/11/19 – 18/12/19
15D	ATC	Mill Lane	25/11/19 – 18/12/19
15E	ATC	Brook Street	25/11/19 – 18/12/19
1	MCC	Ramsgate Rd/ The Quay/ High Street	26/11/19 – 28/11/19
2	MCC	A256 Sandwich Bypass/ Monk's Way	26/11/19 – 28/11/19
3	MCC	A256 Ramsgate Rd/ Ramsgate Road/ A256 Sandwich Bypass	26/11/19 – 28/11/19
4	MCC	A256 Sandwich Bypass/ Ash Road/ A257 Each End	26/11/19 – 28/11/19
5	MCC	A256 Sandwich Bypass/ A258 Deal Rd	26/11/19 – 28/11/19
6	MCC	Deal Road/ A258 Deal Road	26/11/19
7	MCC	Preston Hill/ A257 Gobery Hill/ A257 High Street	26/11/19 – 28/11/19
8	MCC	A257 High Street/ Harrison Rd/ B2046 High Street/ A257 Canterbury Road	26/11/19
9	MCC	B2046 Adisham Road/ Dorman Avenue N	26/11/19 – 28/11/19
11	MCC	B2046 Adisham Road/ Spinney Lane/ Pond Lane	26/11/19 – 28/11/19
12	MCC	B2046 Adisham Road/ A260/ A2 Dover Road	26/11/19 – 28/11/19
13	MCC	A260 Old Dover Road/ A260	26/11/19 – 28/11/19
15	MCC	High Street/ Church Street/ Brook Street/ Lower Street/ Mill Lane	26/11/19
16	MCC	A257 Sandwich Road/ Sandwich Road/ A257 Ash Bypass	26/11/19 – 28/11/19
17	MCC	A256 Richborough Way/ Sandwich Road/ Jutes Lane	26/11/19 – 28/11/19
18	MCC	A260 Canterbury Road/ Alkham Valley Road	26/11/19 – 28/11/19
19	MCC	White Horse Hill/ A20/ A260 White Horse Hill/ A260 Spitfire Way	26/11/19 – 28/11/19
20	MCC	A20/ Alkham Valley Road	26/11/19 – 28/11/19
21	MCC	M2 Junction 7	
22	MCC	Church Hill	5/10/21 – 7/19/21
23	MCC	Wigmore Lane	5/10/21 – 7/19/21
24	MCC	Chapel Hill	5/10/21 – 7/19/21
25	MCC	Shepherdswell Road	5/10/21 – 7/19/21

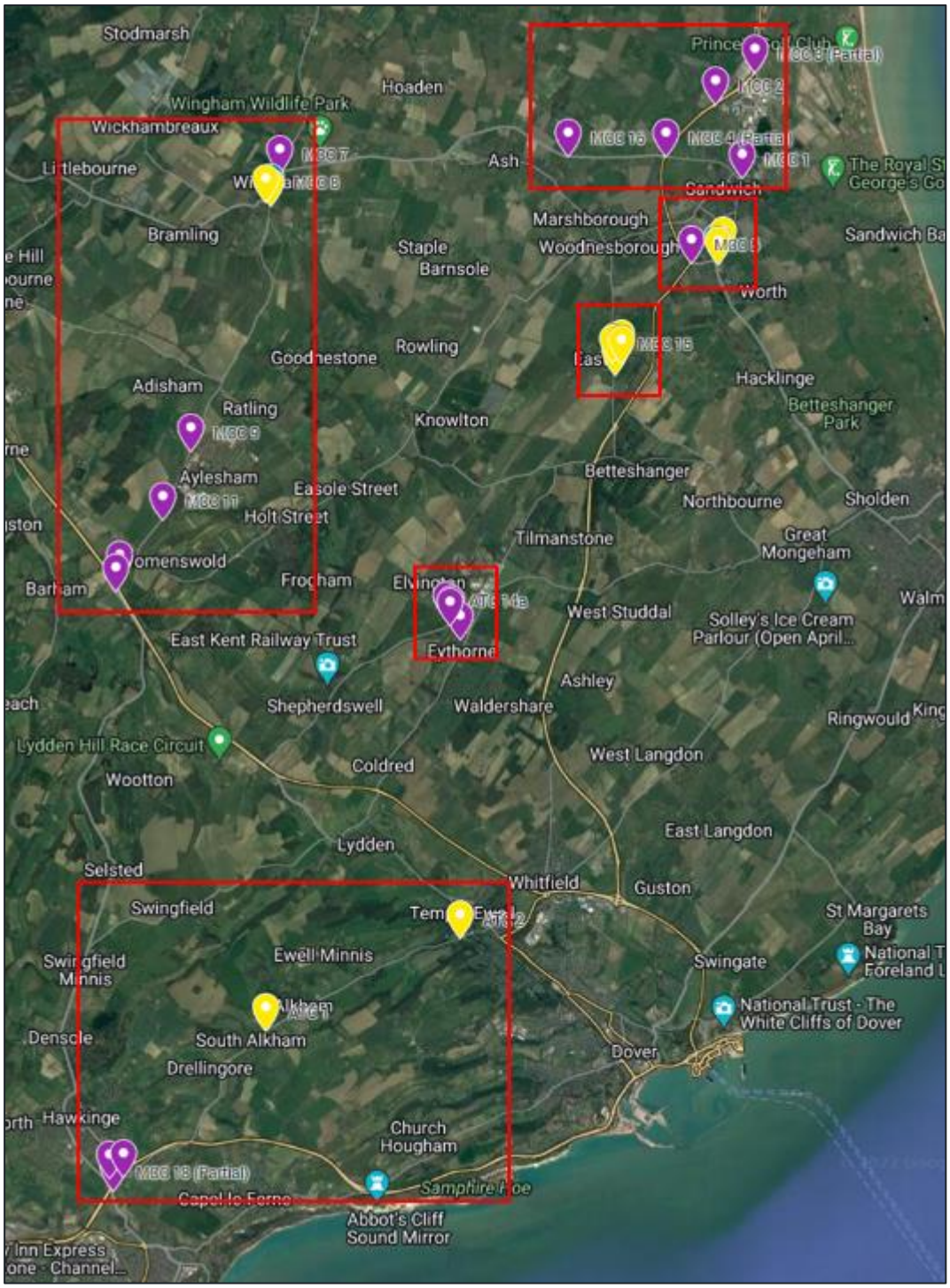


Figure 9-1: Count Locations

9.2.7. Survey data from Intelligent Data was thoroughly checked by WSP and processed, including the removing of outliers, to obtain the average AM Peak (08:00 – 09:00) and average PM Peak (17:00 – 18:00) vehicle counts, in line with the time periods of the VISUM strategic model.

9.2.8. The sites, shown in Figure 9-2 were grouped together to form 6 survey clusters, demonstrated by the red boxes around the counts. AM and PM peak data were input into flow diagrams to represent the observed count data for each of the 6 clusters; where sites were immediately adjacent or had no additional roads between them, traffic flows were balanced to ensure consistency. It is noted that where additional highway network exists between count locations, for example in the Aylesham and Wingham cluster, vehicle counts in the traffic flow diagram will not balance as it is considered that a proportion of both the northbound and southbound flow along Adisham Road will turn off onto Station Road, or other small roads.

9.2.9. The traffic flow diagrams for AM and PM peak, representative of the observed count data, are provided in Appendix Q, in separate document.

Do Minimum

9.2.10. To develop 2040 Do Minimum excel models, percentage growth between the 2015 DDTM and the 2040 Do Minimum VISUM models was extracted for the AM Peak and PM Peak respectively. As the observed data represents 2019 and 2021, growth was interpolated to obtain a 2019 to 2040 and 2021 to 2040 growth factor for each link and applied to the appropriate network locations within the excel model. Where links were present in the excel model but not the VISUM model, due to their proximity from the DDTM Study Area and level of detail incorporated, growth was taken from the closest link that is included within the strategic model.

9.2.11. The 2040 Do Minimum excel models, for the AM and PM Peak, for each of the 6 clusters are presented in Appendix R, in separate document.

Do Something 1

9.2.12. Potential Local Plan sites within and outside of the DDTM study area have been assessed in an excel model to determine the impacts on the existing highway network and identify possible location where mitigation could be required.

9.2.13. Trip generation for the external Local Plan sites was calculated for input into the Do Something VISUM model and was applied in the same quantum within the excel models. Trip distribution was primarily based on 2011 Census data and thus sites were grouped to form Master Sites based on which census zone they fall within. Key consideration was given to proposed access locations when grouping developments, to ensure that impacts on observed counts are accurately incorporated and growth applied. The Master Site grouping are displayed in Figure 9-2 and a detailed suite of images demonstrating how sites have been grouped to form Master Sites.

9.2.14. To ensure that the trips generated from Local Plan sites within the modelled area the following methodology was applied:

- A DS (with mitigation) minus DM plot was obtained for the links representing the external clusters. This could show the additional DS traffic in the cluster
- Remove the trips from external DS sites that would use the cluster using zone flow bundles

- Add additional traffic from the VISUM model into static analysis spreadsheet taking the routing from the DS model as a basis for the additional local plan trips.

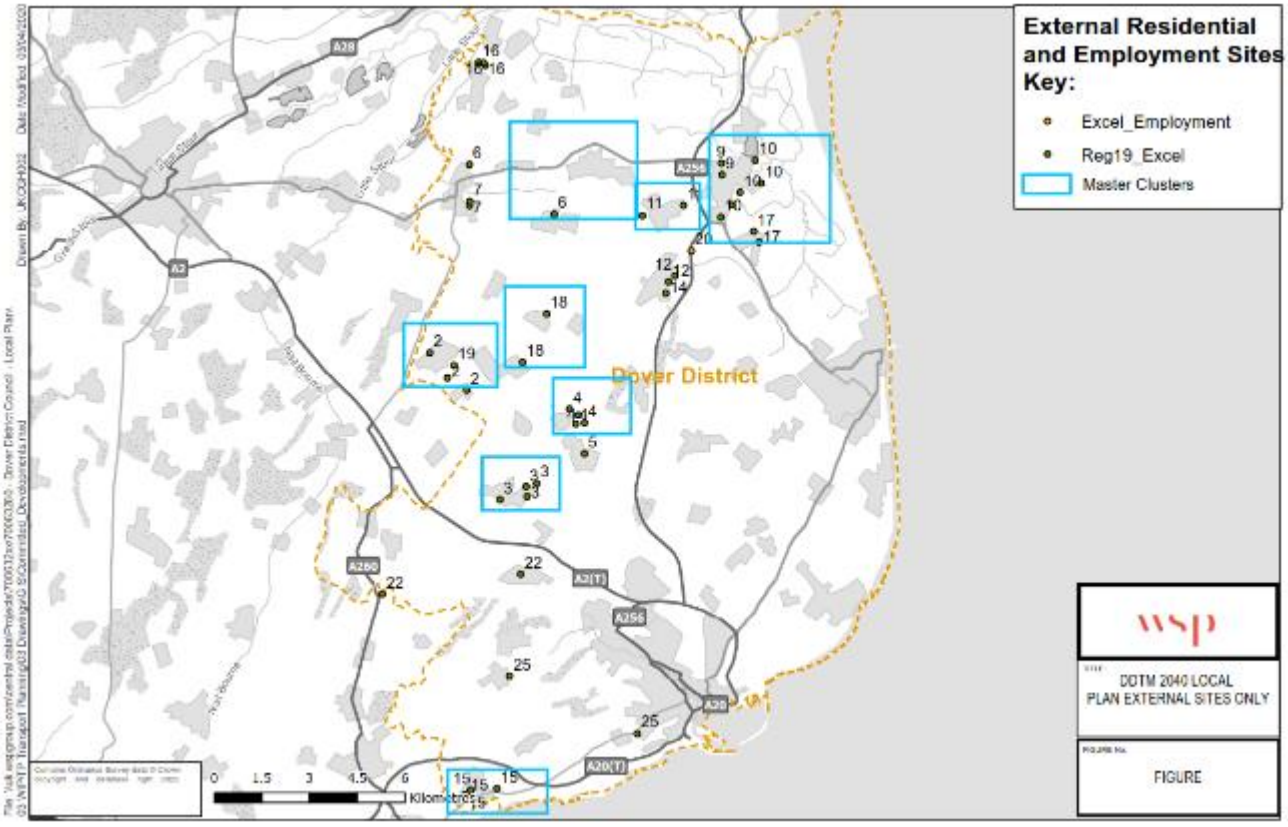


Figure 9-2: Master Clusters for External Sites

9.2.15. Trip generation for each of the unique sites within the Master Site was summed together to calculate the total AM and PM peak trip generation for the Master Sites. A. Following feedback from KCC, WSP have been careful in their grouping of sites to ensure that trips are accessing and egressing the existing network in the correct place; this has been considered in relation to the location of observed data and how these locations have been clustered. The trip generation for each of the Master Sites is presented in Table 9-2; the Master Site numbers correspond to the groupings demonstrated in Figure 9-2.

Table 9-2: Trip Generation for Master Sites

	Master Site	AM Peak (08:00 - 09:00)			PM Peak (17:00 - 18:00)		
		Origin	Destination	Two-Way	Origin	Destination	Two-Way
Residential	2	228	69	297	134	158	322
	3	19	6	25	10	18	27
	4	140	42	183	70	128	198
	5	2	1	2	1	2	2
	6	4	1	5	2	4	5
	7	25	7	32	12	22	35
	8	69	21	90	34	63	97
	9	24	7	31	12	21	33
	10	81	24	105	40	74	114
	11	5	2	7	3	5	7
	12	2	1	2	1	2	2
	14	32	10	41	16	29	45
	15	33	10	43	16	30	46
	16	43	13	56	21	39	61
	17	9	3	11	4	8	12
	18	14	4	18	7	13	20
	22	26	8	34	13	24	37
	23	2	1	2	1	2	2
	25	4	1	5	2	3	5
Employ	19	14	78	92	82	6	88
	20	4	7	11	7	4	11

9.2.16. To determine the likely high-level trip distribution of potential site allocations, or master sites, outside of the DDTM Study Area, WSP extracted Journey to Work (JtW) data from NOMIS – Official Labour Market Statistics. Dataset WU03EW – Location of usual residence and place of work by method of travel to work was downloaded and processed at Middle Super Output Area (MSOA) level to determine, for those driving a car or van, what percentage travel to and from each unique Dover 2011 Census Zone (equivalent to an MSOA), and where they travel to. This exercise was undertaken for Dover MSOAs that are outside of the DDTM Study Area: Dover 001, Dover 002, Dover 006, Dover 008 and Dover 014.

9.2.17. A summary of the distribution is shown in Table 9-3; it is noted that percentages will not sum to 100% as only distributions greater than 0.05% have been presented.

Table 9-3: Dover MSOA JtW Distribution Summary

Place of Work	Usual Residence				
	Dover 001	Dover 002	Dover 006	Dover 008	Dover 014
Basildon	0.05%	0.10%	0.06%	0.05%	0.09%
Barking and Dagenham	0.05%	0.10%	0.06%	0.10%	0.09%
Bexley	0.15%	0.24%	0.13%	0.15%	0.14%
Bromley	0.15%	0.19%	0.19%	0.21%	0.05%
Greenwich	0.15%	0.10%	0.19%	0.15%	0.09%
Hounslow	0.05%	0.10%	0.13%	0.15%	0.05%
Tower Hamlets	0.15%	0.19%	0.19%	0.10%	0.05%
Medway	1.23%	0.72%	1.19%	1.03%	0.90%
Ashford	3.13%	2.64%	3.50%	4.41%	6.45%
Canterbury	34.29%	15.91%	35.73%	15.75%	9.35%
Dartford	0.41%	0.19%	0.38%	0.10%	0.33%
Dover	36.19%	50.22%	36.11%	51.46%	44.40%
Gravesham	0.10%	0.24%	0.19%	0.21%	0.14%
Maidstone	1.90%	1.63%	1.69%	1.80%	1.90%
Shepway	4.25%	6.13%	7.63%	13.60%	28.56%
Swale	2.00%	1.10%	3.75%	1.64%	1.23%
Thanet	10.61%	14.66%	5.01%	5.13%	1.76%
Tonbridge and Malling	0.72%	0.62%	0.75%	0.51%	0.71%
Tunbridge Wells	0.41%	0.14%	0.13%	0.26%	0.38%
Reigate and Banstead	0.51%	0.57%	0.13%	0.31%	0.09%
Horsham	0.05%	0.10%	0.06%	0.05%	0.05%

9.2.18. The detailed trip distribution was applied to the trip generation for each master site and their development trips were added to the Do Minimum excel network using journey planning tools to determine likely route choices between origin and destination. Flow diagrams that represent the Do Something excel models, by time period and for each of the six clusters, are included within Appendix S, in separate document. Alongside the turning and link flows, the actual and percentage flow increases between the Do Something and Do Minimum

have been included. Labelling has been included to represent where each of the master sites access and egress the excel model cluster networks.

9.2.19. Following discussions with KCC and Velocity, the Aylesham developers' consultants, trip distribution and routing for sites within the Aylesham developments were revised in the Refined Do Something scenario to ensure consistency between the WSP assessment of the Local Plan proposals and Velocity's assessment of the Spinney Lane development.

Do Something Local Plan Impacts

Cluster 1

9.2.20. The excel models for the Do Something scenario, Cluster 1 AM Peak, demonstrate an increase of approximately 110 vehicles travelling through the A257 / Preston Hill junction with the most significant increase observed travelling from Preston Hill westbound towards A257 High Street of 42 vehicles. In the PM peak, the total increase is considered to be 116 vehicles, with the largest increases at this junction turning left from A257 towards Preston Hill with an increase of 41 vehicles.

9.2.21. The A257 Canterbury Road / A257 High Street / Harrison Road / B2046 junction is forecast to have an increase of 128 vehicles in the AM peak as a result of the Local Plan allocations; commuter patterns and trip generation forecast that 38 of the additional vehicles are projected turn right onto Canterbury Road from A257 High Street, which is an increase of approximately 5% when compared to the 2040 Do Minimum. In the PM peak, an increase of 221 vehicles is presented at this junction with approximately 32 vehicles turning left from A257 Canterbury Road onto High Street north.

9.2.22. A proportion of potential residential and employment site allocations are in Aylesham which leads to large increases in flows along the B2046 Adisham Road and at the junctions with Dorman Avenue and Spinney Lane, as shown in the Custer 1 AM and PM peak excel models. In the AM Peak, the B2046 High Street northbound sees a maximum increase of 267 vehicles (21%); in the PM Peak this is shown in the southbound direction with an increase of 310 vehicles (37%). These are most likely to represent commuter and school trips, to/from the potential residential and employment allocations, which are typically tidal in the AM and PM peaks.

9.2.23. Spinney Lane is forecast to experience significant increases in the 2040 Do Something scenario, particularly the right turn in movement and left turn out. Master Site 2 (residential) and 19 (employment) both have the potential to be accessed via Spinney Lane and as such the departures in the AM peak are likely to represent trips leaving the residential location and arrivals are employees arriving at the employment site. The reverse is apparent in the PM peak.

Cluster 2

9.2.24. Cluster 2 presents the impacts of the potential site allocations at junctions with Ash and along the A257; increases in vehicle volumes on this excel model are trips primarily

generates by potential developments in Ash and Sandwich. In the AM and PM peaks, the Ash Bypass / Sandwich Road forecast an increase of approximately 93 and 117 respectively.

9.2.25. The A257 / Sandwich Bypass / Ash Road junction presents an additional 242 turning movements in the AM peak as a result of including external Local Plan allocations; the most significant increase is observed to be 46 vehicles (18% increase) turning right from A257 western approach onto A258 Sandwich Bypass. In the PM peak, an increase of approximately 315 vehicles is forecast, with 93 vehicles traveling northbound along Sandwich bypass. This junction has been modelled in detail with results presented in Chapter 8.

9.2.26. The Local Plan allocations are predicted to increase vehicle flows through the A258/Ramsgate junction by 191 vehicles and 246 vehicles in the AM and PM peaks respectively; the dominant movement is the through movement from Sandwich Road to Ramsgate Road in both directions (northbound and southbound), for both peaks.

9.2.27. Within the excel modelling a proportion of local trips to MSOAs within Dover do route via rural roads that are not modelled explicitly within the turning flow diagrams, this includes trips using Monks Way eastbound and Ramsgate Road southbound.

Cluster 3

9.2.28. The impacts of the potential external site allocation on A256 Sandwich Bypass / A258 Deal Road and A258 Deal Road W / E / S are presented in Cluster 3. In the AM Peak, decreases of approximately 41 vehicles is demonstrated at the A256/A258 roundabout with the most significant reduction apparent on the A256 Sandwich Road southbound of 75 vehicles, this is due to the increased delay on this link and as such local plan traffic reroutes away from the junction. This junction has been modelled in detail with results presented in Chapter 8.

9.2.29. In the PM Peak, an increase of approximately 219 vehicles is demonstrated at the A256/A258 roundabout with the most significant increase being 149 vehicles (19%) from A256 northbound approach to A258 towards Deal.

Cluster 4

9.2.30. Cluster 4 represents the forecast turning movements at the High Street / Church Street / Brooke Street / Mill Lane 5-arm junction within Eastry and presents the likely impacts on the turning flows as a result of incorporating the Local Plan allocations.

9.2.31. In the AM peak, an increase of 49 vehicles is demonstrated with the most significant increase being shown along the Lower Street northbound approach, an increase of 41% of vehicles when compared with the Do Minimum flows.

9.2.32. In the PM peak demonstrates an increase of 40 vehicles using this junction, with the most significant movement shown to be those using the Lower Street northbound approach towards the High Street, this is an increase of 29 flows compared with the Do Minimum.

Cluster 5

9.2.33. It is noted that cluster 5 contains only one key junction within Eythorne. The Do Something excel model for the AM demonstrates an increase of approximately 234 vehicles at this junction, with 151 (65%) additional vehicles approaching from Church Hill. In the PM peak, 305 vehicles are forecast with 110 (36%) approaching from Shepherdswell Road.

9.2.34. KCC raised concerns regarding the additional flow anticipated on Shepherdswell Road due to the narrow, rural nature of the road. To understand the impact the additional DS traffic would have on the driving behaviour a static analysis was undertaken, the following methodology was applied:

- Speeds, distance, passing points and volumes of cars in each direction of the single carriageway between Church Hill/ Shooters Hill and the A2 was measured. This found the following:
  - Speed: 64kph
  - Distance: 2.13km
  - Time: 2 minutes
- With this information the total number of cars in either direction of the single carriageway in the DM and DS was analysed, this is shown in Table 9-4.

Table 9-4: Shepherdswell Static Analysis, vehicles a minute

Time Period	Direction	DM	DS1	DS1-DM
AM	NB	3.3	3.8	0.5
	SB	3.5	4.9	1.4
PM	NB	2.7	4.5	1.9
	SB	1.7	2.4	0.7

9.2.35. Based on the 2-minute travel time along the single carriageway section, the AM peak is anticipated to have an average additional 1 northbound vehicles in the DS compared with the DM and 3 additional southbound every 2 minutes. This would result in a conflict of three vehicles over the 2.13km single stretch; given there are 4 passing points along the route the impact of this is anticipated to be minimal.

9.2.36. The same analysis was undertaken for the PM, this found there to be an additional 4 northbound cars in the DS and an additional 1 southbound cars. On average this would result in an additional 4 conflicts at any given time, again as there are 4 passing points along the single carriageway route the impact of this is anticipated to be minimal.

9.2.37. The Shepherdswell analysis presented shows that the additional DS traffic is unlikely to cause significant issues on the highway network.

Cluster 6

9.2.38. The impacts of the potential site allocation on Alkham Valley, and surrounding area, are presented in Cluster 6 for the AM and PM peak. There are few allocations south of Dover town centre and as such it is expected that the impacts of the potential allocations will be less significant in this area.

9.2.39. In the AM peak, an additional 191 vehicles are forecast to use the A260 Spitfire Way / White Horse Hill / A20 E junction; these movements are primarily vehicles turning on to or off of the A20. The A260 Canterbury Road / Alkham Valley Road presents a decrease of 36 vehicles on the southbound approach to Alkham Valley Road from A260 Canterbury Road.

9.2.40. An additional 258 vehicles are forecast to use the A260 Spitfire Way / White Horse Hill / A20 E junction in the PM peak; similar to the AM peak, the majority of these movements are turning on to or off of the A20 eastbound. The A260 Canterbury Road / Alkham Valley Road demonstrates an increase of 220 vehicles with most vehicles turning from Alkham Valley Road onto A260 Canterbury Road southbound.

9.2.41. A summary detailing the key junctions which experience the greatest increases in traffic flows as a result of the Local Plan proposals are shown in Table 9-5.

Table 9-5: External Local Plan Allocations, Junction Impacts, Do Something 1 vs Do Minimum

	AM Peak		PM Peak	
	Actual Difference	% Difference	Actual Difference	% Difference
A257 High Street / Harrison Rd / B2046 High Street / A257 Canterbury Rd	128	7.06%	221	10.62%
B2046 Adisham Rd / Dorman Avenue	90	6.89%	96	5.69%
B2046 Adisham Rd / Spinney Lane	273	17.87%	249	15.30%
A257 / Sandwich Bypass / Ash Rd	242	6.60%	315	8.98%
Ramsgate Rd / Sandwich Bypass	191	5.50%	246	6.88%
A256 Sandwich Bypass / A258 Deal Rd / A256 (S)	-41	-1.53%	219	8.60%
A258 Deal Road W / E / S	-3	-1.46%	137	6.61%
High Street / Church Street / Brooke Street / Lower Street	99	23.52%	108	29.92%
Wigmore Lane / Shooters Hill / Shepherdswell Rd / Church Hill	234	32.19%	305	48.34%
A260 Canterbury Rd / Alkham Valley Rd	137	4.95%	220	9.12%

10 Recommendations

10.1 Introduction

10.1.1. WSP were commissioned by DDC to undertake forecast transport modelling required to assess the Local Plan proposals for Regulation 19. The assessment of the allocations will provide DDC, KCC and NH evidence of the impacts that the proposed Local Plan sites will have on the existing highway network, specific junctions and assist in identifying potential mitigation measures required to support the allocations.

10.2 Findings

10.2.1. Following a strategic assessment of Regulation 19 Local Plan allocations, the impacts the proposals have on the highway network have been assessed and key areas where performance deteriorates identified. DDC have discussed all the areas on the highway network where deterioration occurs with KCC and NH and agreed the best course of action. This has resulted in junction modelling being undertaken for a number of junctions to date, Whitfield roundabout, Duke of York roundabout, A256/A2 dumbbell, London Road/ Alkham Valley Road, A256/ Boys Hill roundabout, A258/ Station Road/ Grams Road, A256/ Deal Road and A256/A257/ Ash Road. The purpose of the detailed junction modelling is to assess the impacts of the Local Plan and if necessary, identify and assess the impacts of junction improvements.

10.2.2. The detailed junction modelling has identified junction improvements at both Whitfield and Duke of York roundabouts which have been agreed with KCC and NH. The junction modelling at A256/ A2 and A256/ Boys Hill roundabout identified that the impacts of the Local Plan are minimal, and no improvements are required. Again this has been agreed with NH and KCC. At London Road/ Alkham Valley Road and A258/ Station Road/ Grams Road potential improvements have been identified and modelled but need to be further discussed with KCC. At the A256/ A258 and A256/ A257/ Ash Road junctions capacity issues have been identified and potential solutions need to be discussed with KCC.

10.3 Next Steps

10.3.1. The next steps for this work will be to agree the outstanding junction requirements with KCC and NH. It will also be important to continue to progress the Whitfield and Duke of York roundabout improvements taking them to Road Safety Audit Stage 1.



WSP House
70 Chancery Lane
London
WC2A 1AF

wsp.com

PUBLIC