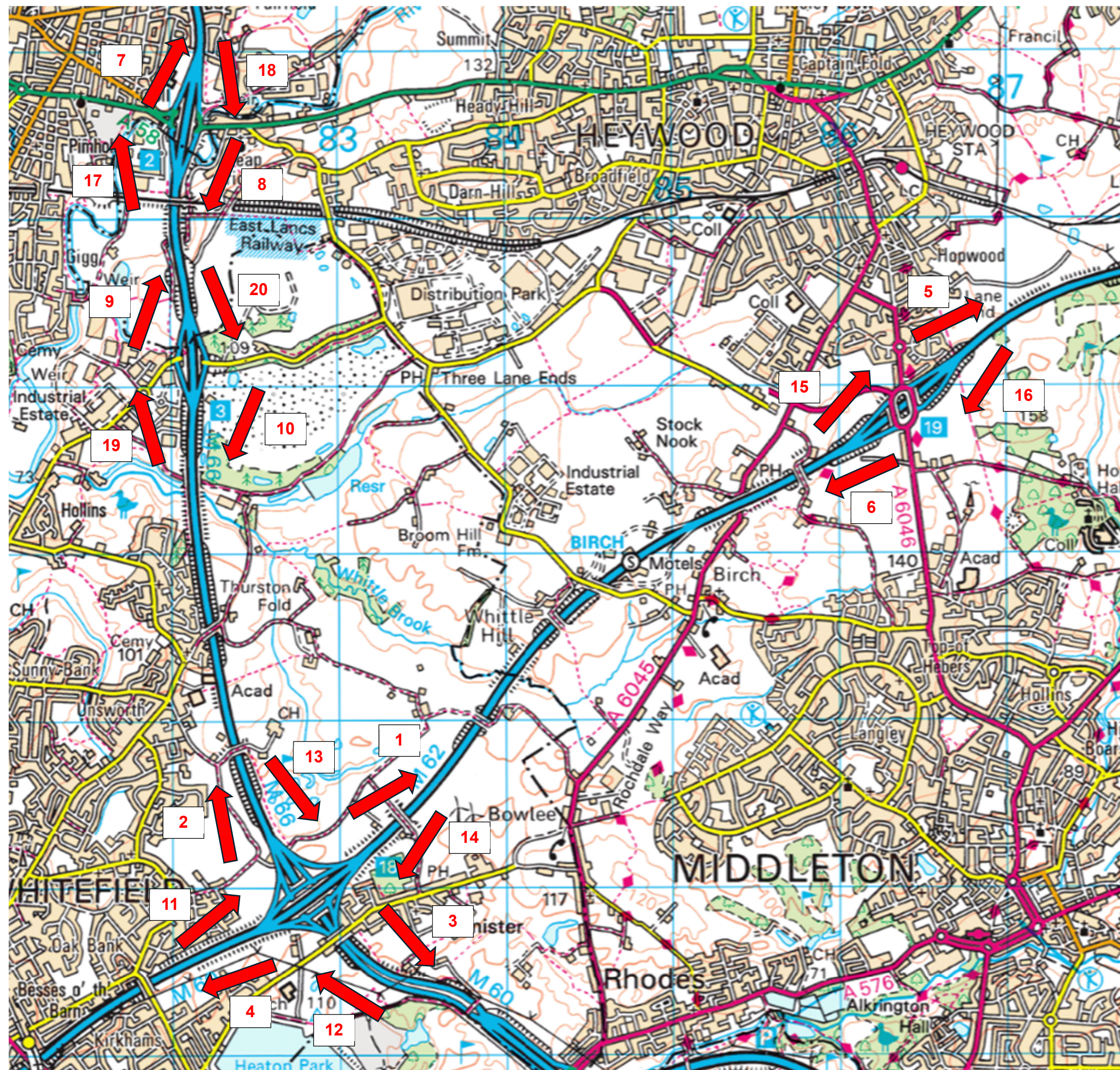


Appendix Z: Merge and Diverge Assessments



No.	Location	Existing Layout Type	Number of Lanes		
			C	U	D
1	M62 J18 EB Merge	E	2	3	4
2	M62 J18 NB Merge	E	2	2	3
3	M62 J18 SB Merge	D	2	2	4
4	M62 J18 WB Merge	E	2	3	4
5	M62 J19 EB Merge	A	1	4	4
6	M62 J19 WB Merge	A	1	4	4
7	M66 J2 NB Merge	A	1	2	2
8	M66 J2 SB Merge	D / E	1	2	3
9	M66 J3 NB Merge	A	1	3	3
10	M66 J3 SB Merge	A	1	3	3
11	M62 J18 EB Diverge	F	2	4	3
12	M62 J18 NB Diverge	E	3	4	2
13	M62 J18 SB Diverge	E	2	4	2
14	M62 J18 WB Diverge	C	1	4	3
15	M62 J19 EB Diverge	A	1	4	4
16	M62 J19 WB Diverge	A	1	4	4
17	M66 J2 NB Diverge	C	1	3	2
18	M66 J2 SB Diverge	A	1	2	2
19	M66 J3 NB Diverge	A	1	3	3
20	M66 J3 SB Diverge	A	1	3	3

KEY

C = Connector Road

U = Upstream Lanes

D = Downstream Lanes

MERGE / DIVERGE ANALYSIS LOCATIONS

CD122 Geometric design of grade separated junctions

Merge and Diverge Layouts

Model Runs Assessed

Run 10: 2039 Do Minimum - Policy Off

Run 14: 2039 Do Something 3 (JPA1.1+ JPA1.2) - With M62 Access Solution - Policy Off

Run 13: 2039 Do Something 3 (JPA1.1+ JPA1.2) - Without M62 Access Solution - Policy Off

Run 8: 2032 Do Something 3 (JPA1.1 + JPA1.2, partial build out to 2032) - Without M62 Access Solution - Policy Off

Run 21: 2039 Do Something 3 (JPA1.1+ JPA1.2) - Without M62 Access Solution - Policy On

Merge Layouts

Figure 3.14a Layout A option 1 - taper merge

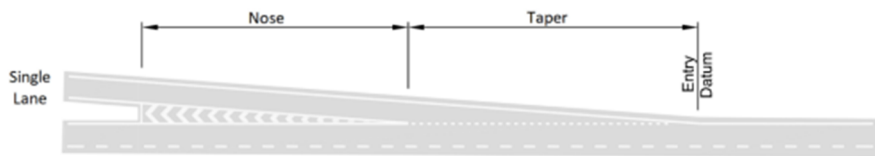


Figure 3.14b Layout A option 2 - 2 lane taper

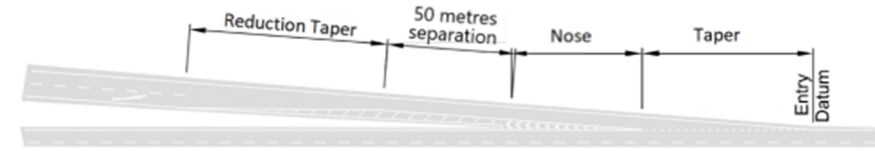


Figure 3.14c Layout B - parallel merge



Figure 3.14d Layout C - ghost island merge

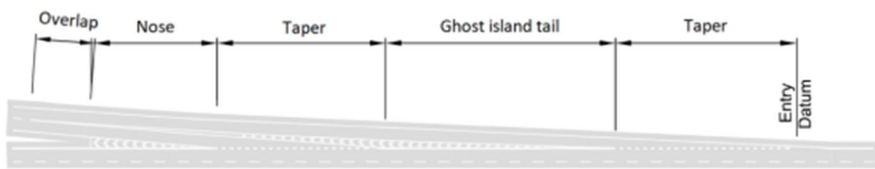


Figure 3.14i Layout G Option 1 - mainline lane gain and double ghost island merge

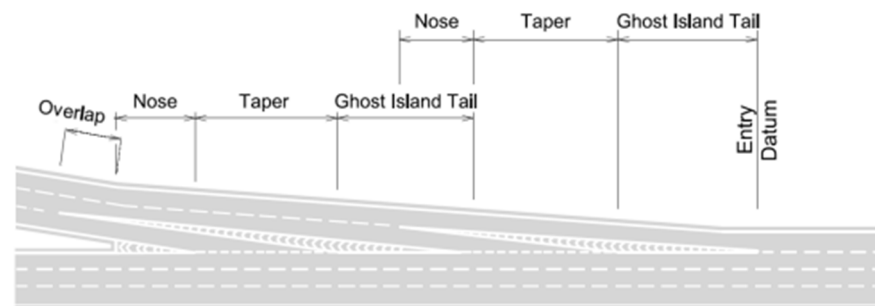


Figure 3.14j Layout G Option 2 - mainline lane gain and single ghost island merge

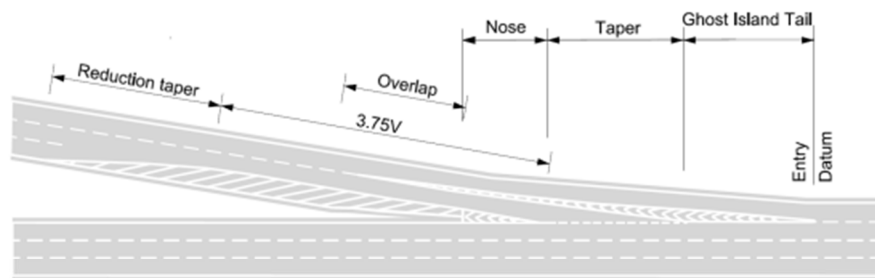


Figure 3.14k Layout H - mainline 2 lane gain and ghost island merge

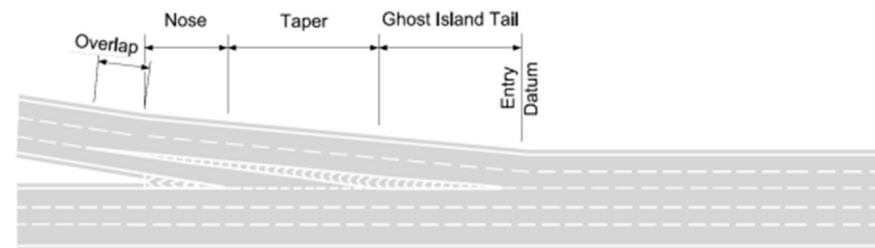


Figure 3.14e Layout D - lane gain

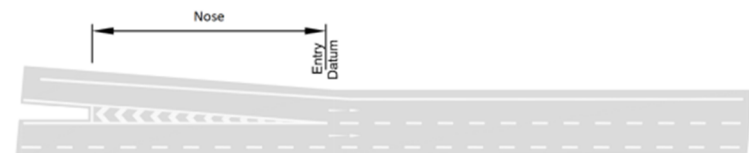


Figure 3.14f Layout E Option 1 - lane gain with ghost island offside merge

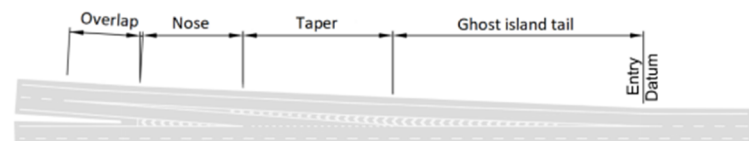
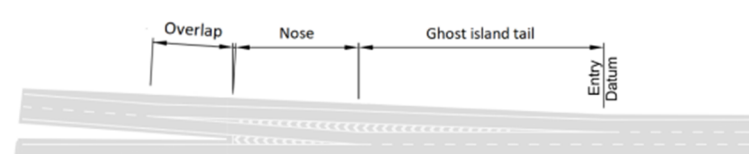


Figure 3.14g Layout E Option 2 - lane gain with ghost island nearside merge



Figure 3.14h Layout F - 2 lane gain with ghost island



Diverge Layouts

Figure 3.30a Layout A option 1 - taper diverge

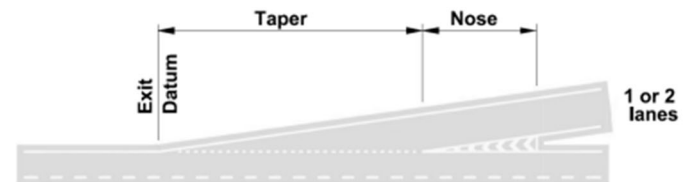


Figure 3.30b Layout A option 2 - Single lane auxiliary diverge



Figure 3.30c Layout B option 1 - ghost island diverge

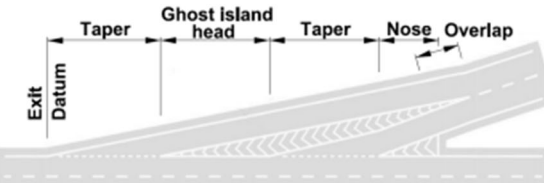


Figure 3.30d Layout B option 2 - Two-lane auxiliary diverge

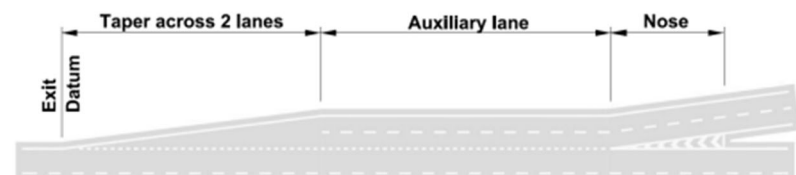


Figure 3.30e Layout C Option 1 - lane drop with 1-lane connector road

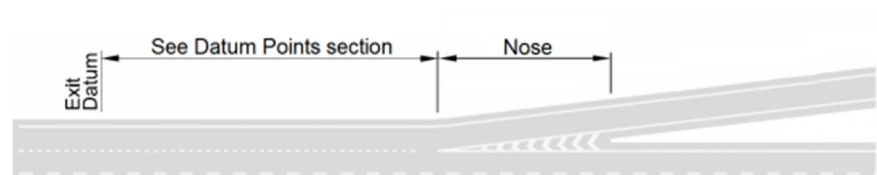


Figure 3.30f Layout C Option 2 - lane drop with 2-lane connector road

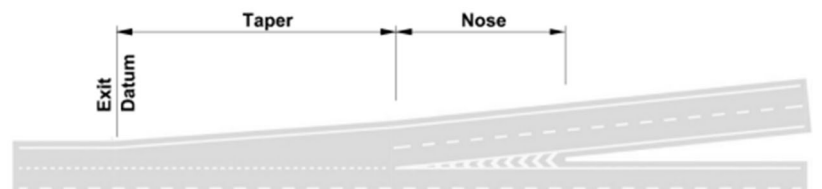


Figure 3.30g Layout D option 1 - ghost island lane drop

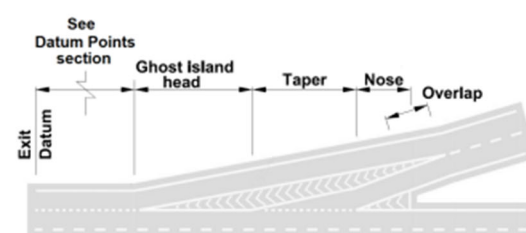


Figure 3.30h Layout D option 2 - auxiliary lane lane drop

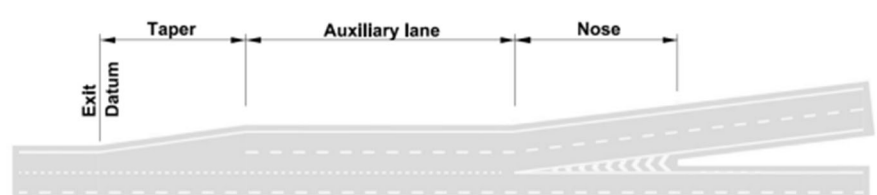


Figure 3.30i Layout E - 2-lane drop

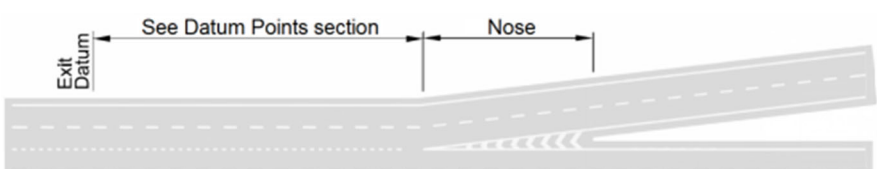
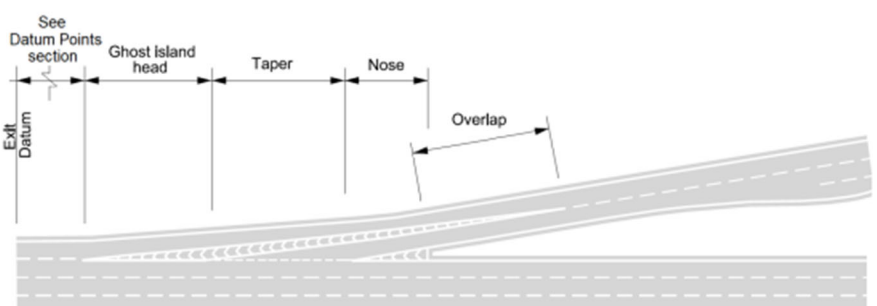
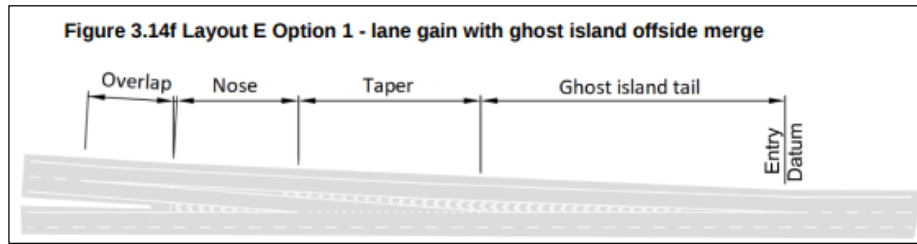


Figure 3.30j Layout F - mainline lane drop and ghost island diverge



Existing Layout CD122 Layout Diagram

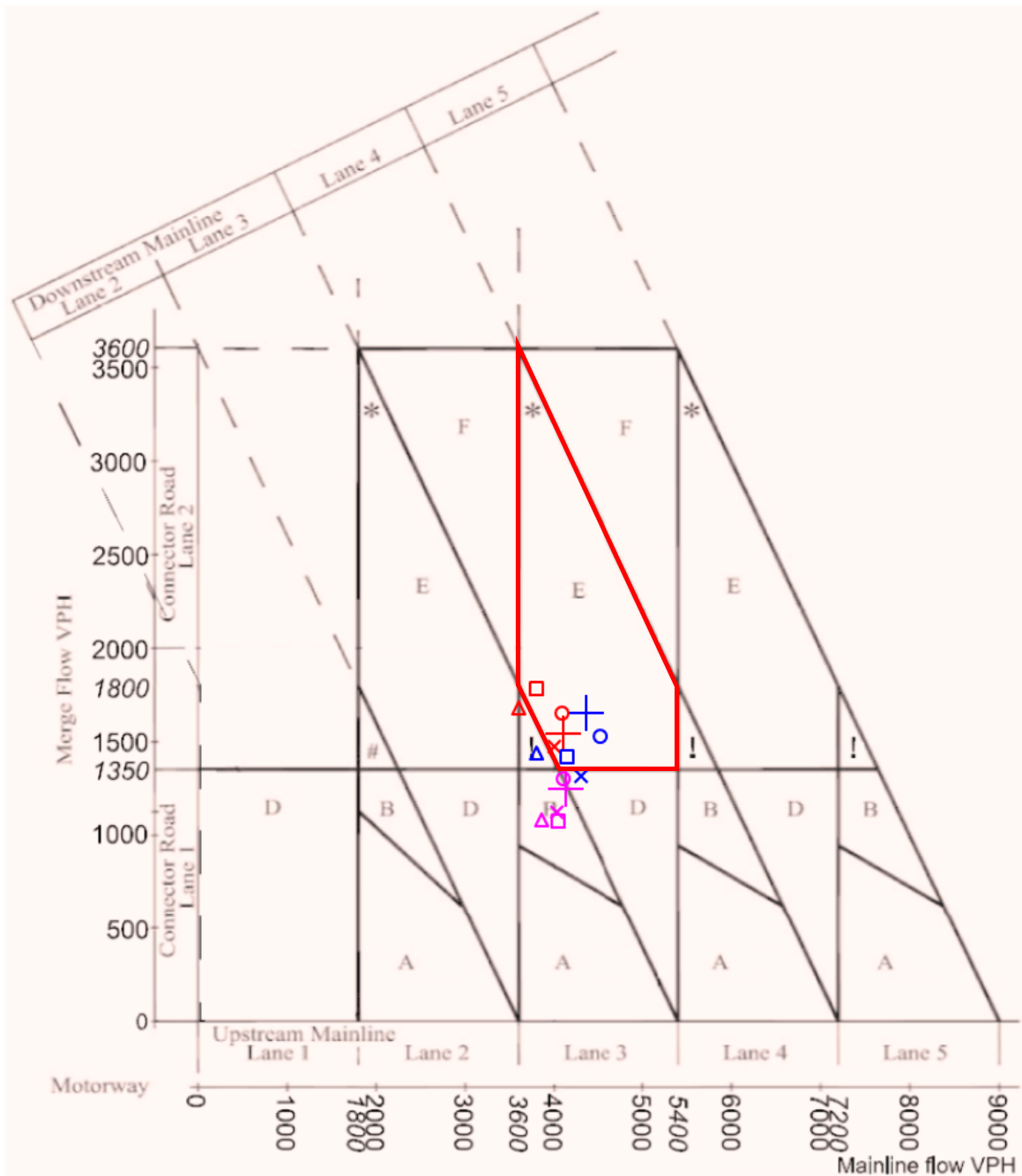


Existing Layout Satellite Image



NGTM Model Fows			
Scenario	Mainline Flow VPH	Merge Flow VPH	Key
Run 10 AM Peak	4130	1533	+
Run 10 Inter Peak	4162	1235	+
Run 10 PM Peak	4393	1639	+
Run 14 AM Peak	4031	1465	x
Run 14 Inter Peak	4069	1108	x
Run 14 PM Peak	4333	1305	x
Run 13 AM Peak	4125	1639	o
Run 13 Inter Peak	4141	1286	o
Run 13 PM Peak	4557	1520	o
Run 8 AM Peak	3833	1775	□
Run 8 Inter Peak	4083	1059	□
Run 8 PM Peak	4184	1403	□
Run 21 AM Peak	3634	1670	△
Run 21 Inter Peak	3887	1067	△
Run 21 PM Peak	3835	1427	△

Figure 3.12b Motorway merging diagram



KEY

Existing Layout

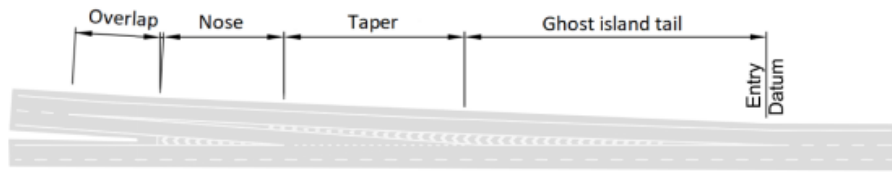
	Scenario	Layout Type	Lane Configuration			Is Existing Layout Adequate?
			Connector Road	Upstream Mainline	Downstream Mainline	
	Existing Layout	E	2	3	4	
Key	Layout Required					
x	Run 14 AM Peak	E	2	3	4	✓
x	Run 14 Inter Peak	B	1	3	3	✓
x	Run 14 PM Peak	D	1	3	4	✓
o	Run 13 AM Peak	E	2	3	4	✓
o	Run 13 Inter Peak	D	1	3	4	✓
o	Run 13 PM Peak	E	2	3	4	✓
□	Run 8 AM Peak	E	2	3	4	✓
□	Run 8 Inter Peak	B	1	3	3	✓
□	Run 8 PM Peak	E	2	3	4	✓
△	Run 21 AM Peak	A Option 2	2	3	3	✓
△	Run 21 Inter Peak	B	1	3	3	✓
△	Run 21 PM Peak	A Option 2	2	3	3	✓

KEY

- ✓ Adequate
- x Requires further investigation

Existing Layout CD122 Layout Diagram

Figure 3.14f Layout E Option 1 - lane gain with ghost island offside merge

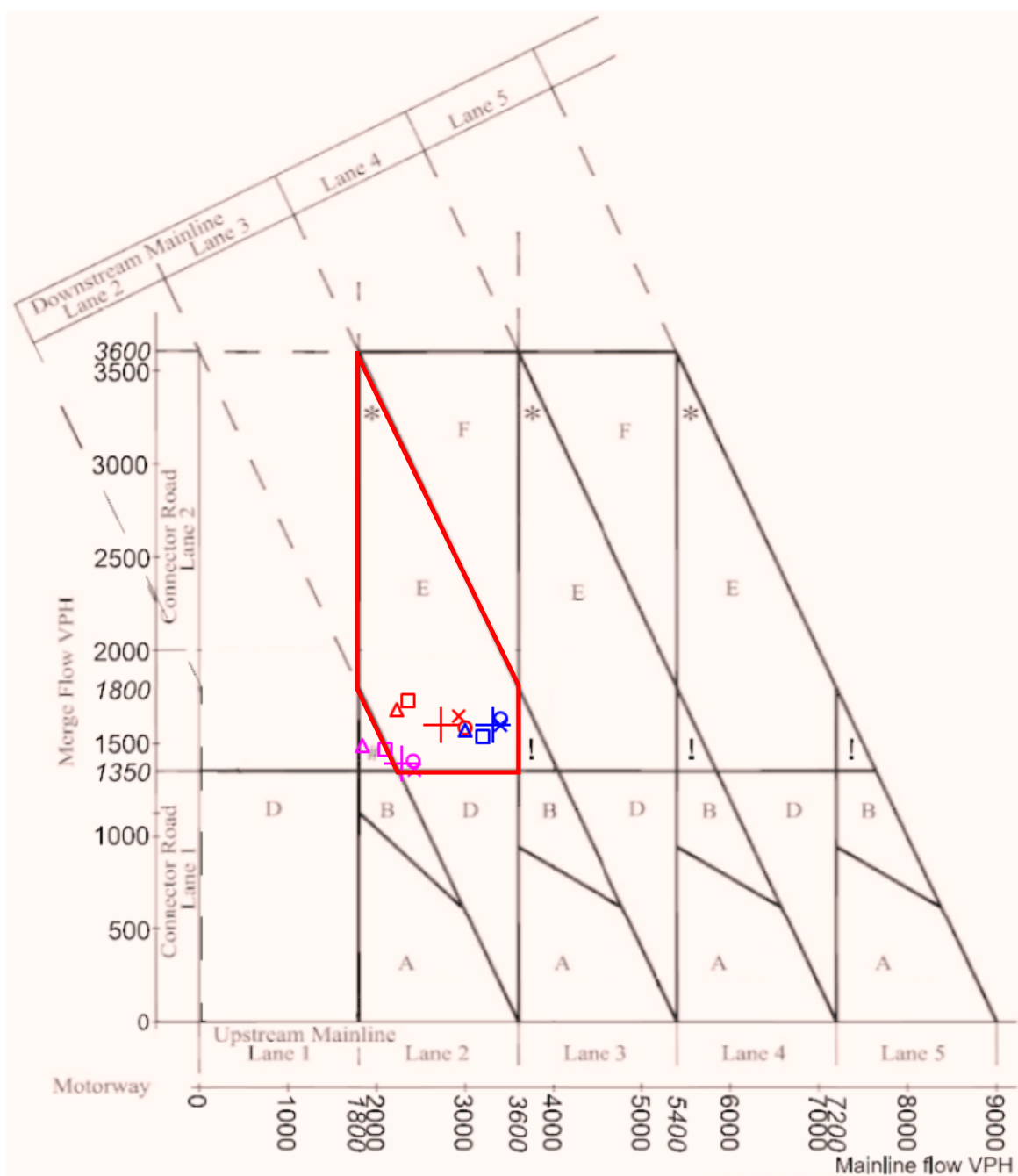


Existing Layout Satellite Image



NGTM Model Fows			
Scenario	Mainline Flow VPH	Merge Flow VPH	Key
Run 10 AM Peak	2759	1587	+
Run 10 Inter Peak	2319	1377	+
Run 10 PM Peak	3354	1588	+
Run 14 AM Peak	2956	1632	x
Run 14 Inter Peak	2453	1346	x
Run 14 PM Peak	3431	1589	x
Run 13 AM Peak	3037	1570	o
Run 13 Inter Peak	2438	1393	o
Run 13 PM Peak	3434	1621	o
Run 8 AM Peak	2385	1720	□
Run 8 Inter Peak	2126	1454	□
Run 8 PM Peak	3228	1522	□
Run 21 AM Peak	2260	1669	△
Run 21 Inter Peak	1874	1475	△
Run 21 PM Peak	3027	1559	△

Figure 3.12b Motorway merging diagram



KEY

Existing Layout

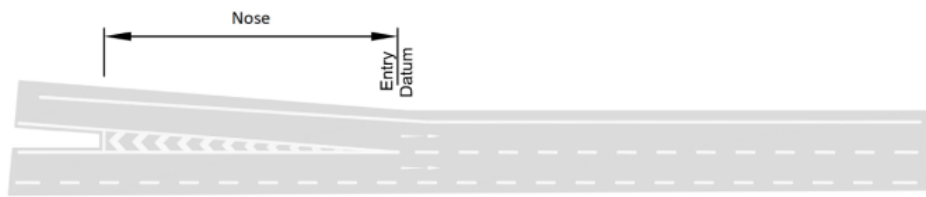
	Scenario	Layout Type	Lane Configuration			Is Existing Layout Adequate?
			Connector Road	Upstream Mainline	Downstream Mainline	
	Existing Layout	E	2	2	3	
Key	Layout Required					
x	Run 14 AM Peak	E	2	2	3	✓
x	Run 14 Inter Peak	D	1	2	3	✓
x	Run 14 PM Peak	E	2	2	3	✓
o	Run 13 AM Peak	E	2	2	3	✓
o	Run 13 Inter Peak	E	2	2	3	✓
o	Run 13 PM Peak	E	2	2	3	✓
□	Run 8 AM Peak	E	2	2	3	✓
□	Run 8 Inter Peak	E	2	2	2	✓
□	Run 8 PM Peak	E	2	2	3	✓
△	Run 21 AM Peak	E	2	2	3	✓
△	Run 21 Inter Peak	E	2	2	2	✓
△	Run 21 PM Peak	E	2	2	3	✓

KEY

- ✓ Adequate
 x Requires further investigation

Existing Layout CD122 Layout Diagram

Figure 3.14e Layout D - lane gain

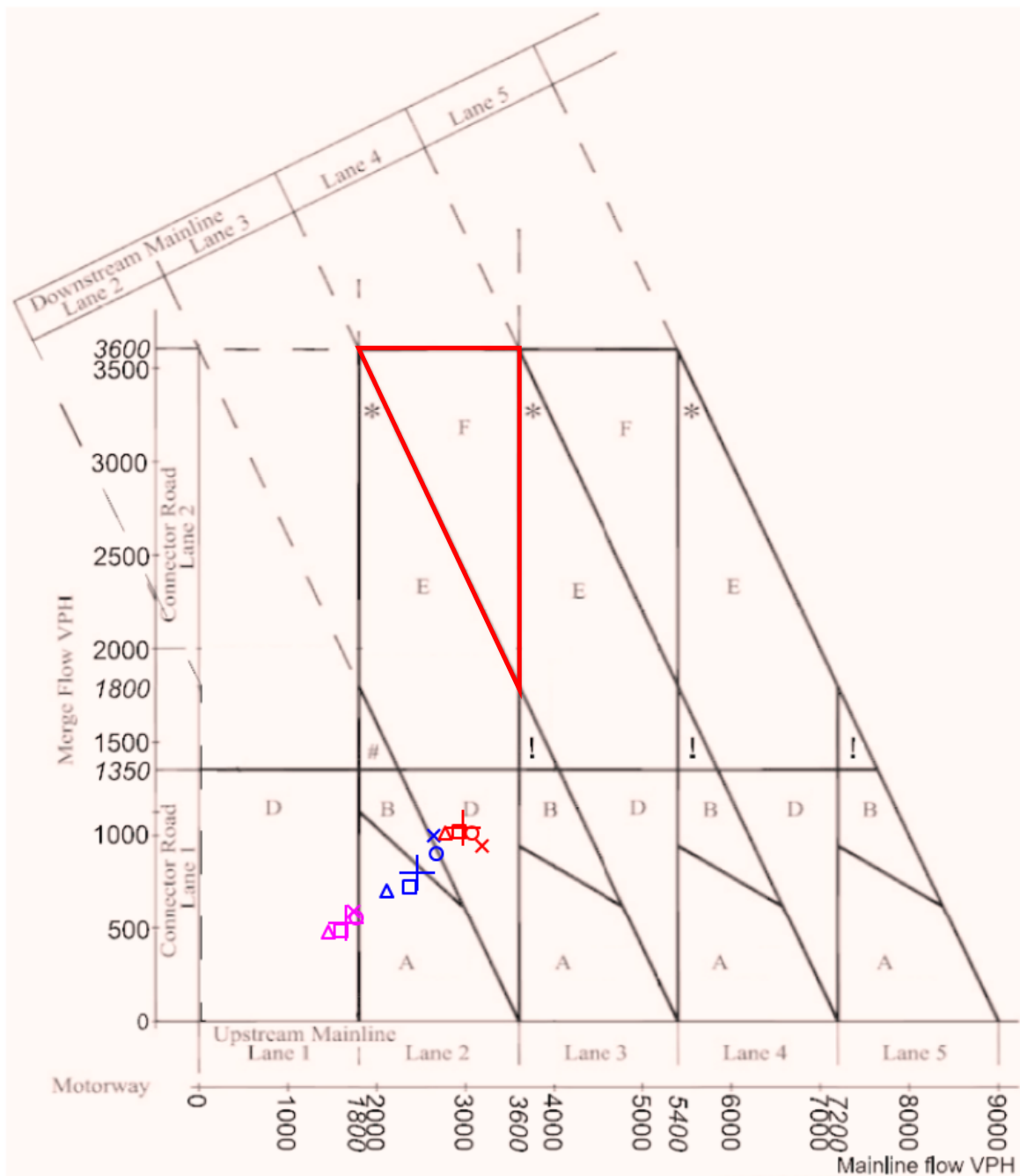


Existing Layout Satellite Image



NGTM Model Fows			
Scenario	Mainline Flow VPH	Merge Flow VPH	Key
Run 10 AM Peak	3010	1030	+
Run 10 Inter Peak	1686	515	+
Run 10 PM Peak	2492	785	+
Run 14 AM Peak	3216	930	x
Run 14 Inter Peak	1764	576	x
Run 14 PM Peak	2675	988	x
Run 13 AM Peak	3109	1001	o
Run 13 Inter Peak	1792	546	o
Run 13 PM Peak	2696	889	o
Run 8 AM Peak	2962	1007	□
Run 8 Inter Peak	1623	472	□
Run 8 PM Peak	2397	713	□
Run 21 AM Peak	2799	996	△
Run 21 Inter Peak	1489	466	△
Run 21 PM Peak	2140	690	△

Figure 3.12b Motorway merging diagram



KEY

Existing Layout NOTE - NON-STANDARD LAYOUT WITH TWO LANE GAIN IN FIRMAT OF LAYOUT D

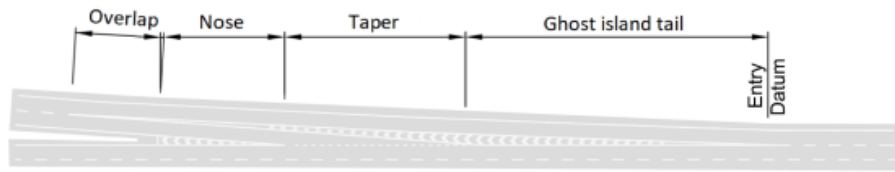
	Scenario	Layout Type	Lane Configuration			Is Existing Layout Adequate?
			Connector Road	Upstream Mainline	Downstream Mainline	
	Existing Layout	D	2	2	4	
Key	Layout Required					
x	Run 14 AM Peak	D	1	2	3	✓
x	Run 14 Inter Peak	D	1	1	2	✓
x	Run 14 PM Peak	D	1	2	3	✓
o	Run 13 AM Peak	D	1	2	3	✓
o	Run 13 Inter Peak	D	1	1	2	✓
o	Run 13 PM Peak	B	1	2	2	✓
□	Run 8 AM Peak	D	1	2	3	✓
□	Run 8 Inter Peak	D	1	1	2	✓
□	Run 8 PM Peak	A	1	2	2	✓
△	Run 21 AM Peak	D	1	2	3	✓
△	Run 21 Inter Peak	D	1	1	2	✓
△	Run 21 PM Peak	A	1	2	2	✓

KEY

- ✓ Adequate
- x Requires further investigation

Existing Layout CD122 Layout Diagram

Figure 3.14f Layout E Option 1 - lane gain with ghost island offside merge

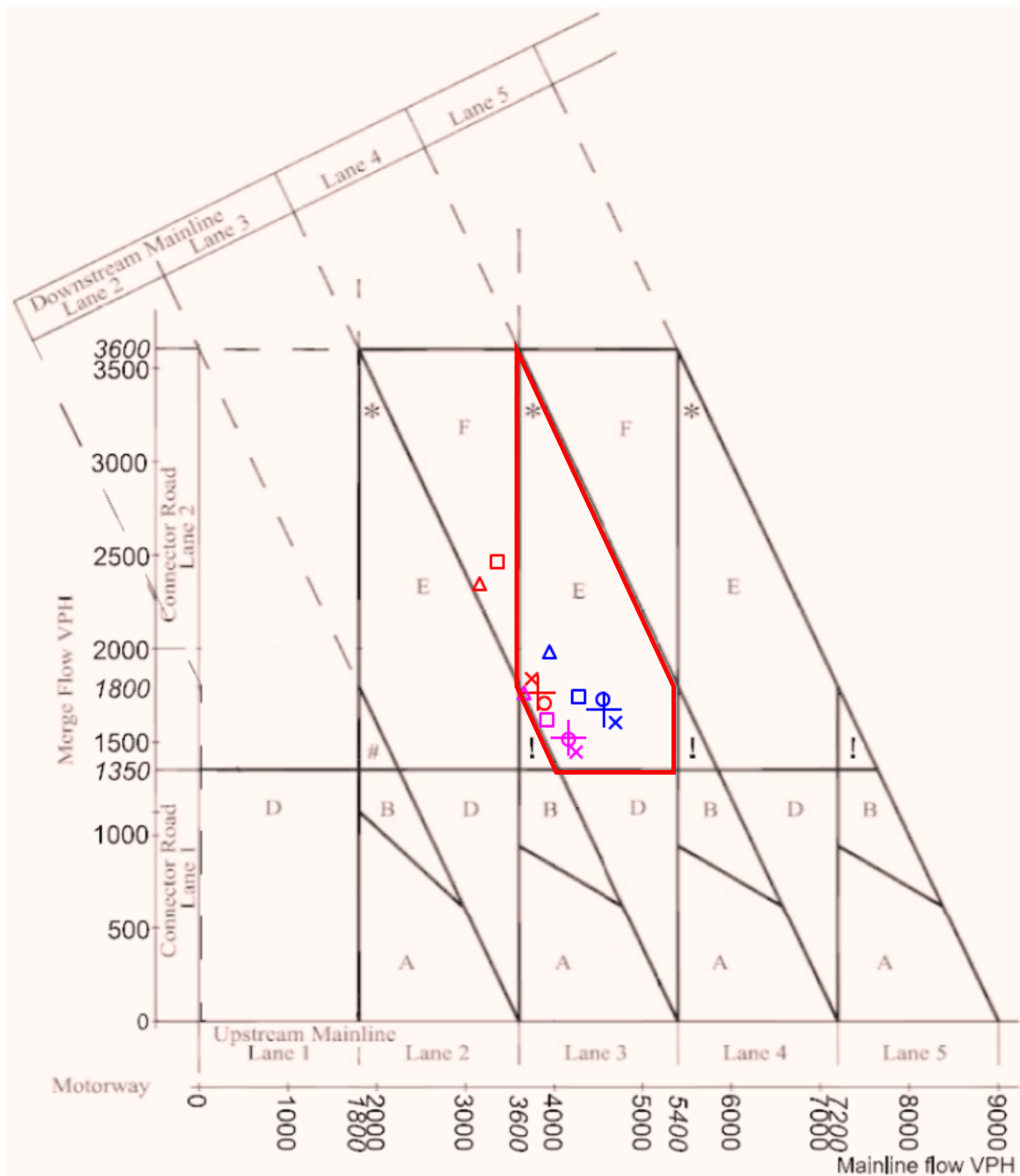


Existing Layout Satellite Image



NGTM Model Fows			
Scenario	Mainline Flow VPH	Merge Flow VPH	Key
Run 10 AM Peak	3855	1751	+
Run 10 Inter Peak	4191	1511	+
Run 10 PM Peak	4597	1661	+
Run 14 AM Peak	3783	1830	x
Run 14 Inter Peak	4280	1432	x
Run 14 PM Peak	4726	1596	x
Run 13 AM Peak	3914	1693	o
Run 13 Inter Peak	4192	1502	o
Run 13 PM Peak	4578	1718	o
Run 8 AM Peak	3390	2455	□
Run 8 Inter Peak	3945	1608	□
Run 8 PM Peak	4315	1730	□
Run 21 AM Peak	3193	2340	△
Run 21 Inter Peak	3694	1751	△
Run 21 PM Peak	3982	1971	△

Figure 3.12b Motorway merging diagram



KEY

Existing Layout

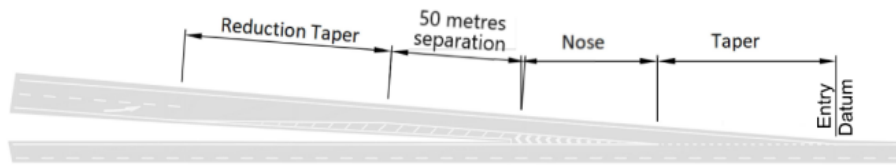
	Scenario	Layout Type	Lane Configuration			Is Existing Layout Adequate?
			Connector Road	Upstream Mainline	Downstream Mainline	
	Existing Layout	E	2	3	4	
Key	Layout Required					
✗	Run 14 AM Peak	E	2	3	4	✓
✗	Run 14 Inter Peak	E	2	3	4	✓
✗	Run 14 PM Peak	E	2	3	4	✓
○	Run 13 AM Peak	E	2	3	4	✓
○	Run 13 Inter Peak	E	2	3	4	✓
○	Run 13 PM Peak	E	2	3	4	✓
□	Run 8 AM Peak	F	2	2	4	✓
□	Run 8 Inter Peak	E	2	3	4	✓
□	Run 8 PM Peak	E	2	3	4	✓
△	Run 21 AM Peak	F	2	2	4	✓
△	Run 21 Inter Peak	E	2	3	4	✓
△	Run 21 PM Peak	E	2	3	4	✓

KEY

- ✓ Adequate
✗ Requires further investigation

Existing Layout CD122 Layout Diagram

Figure 3.14b Layout A option 2 - 2 lane taper

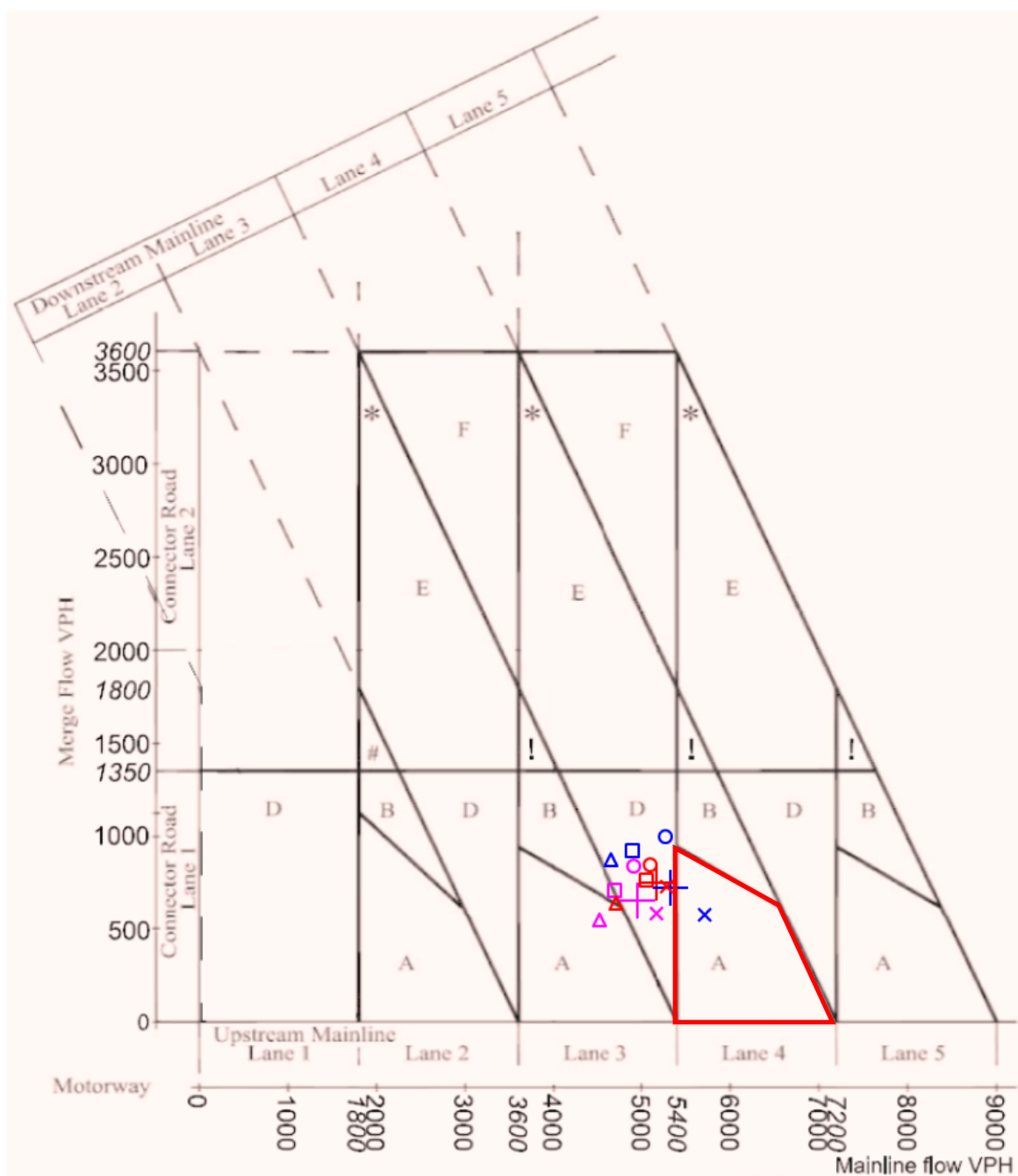


Existing Layout Satellite Image



NGTM Model Fows			
Scenario	Mainline Flow VPH	Merge Flow VPH	Key
Run 10 AM Peak	5203	739	+
Run 10 Inter Peak	4985	644	+
Run 10 PM Peak	5348	713	+
Run 14 AM Peak	5308	715	x
Run 14 Inter Peak	5201	573	x
Run 14 PM Peak	5746	564	x
Run 13 AM Peak	5125	832	o
Run 13 Inter Peak	4940	826	o
Run 13 PM Peak	5299	988	o
Run 8 AM Peak	5082	748	□
Run 8 Inter Peak	4727	694	□
Run 8 PM Peak	4930	907	□
Run 21 AM Peak	4732	625	△
Run 21 Inter Peak	4550	537	△
Run 21 PM Peak	4679	863	△

Figure 3.12b Motorway merging diagram



KEY

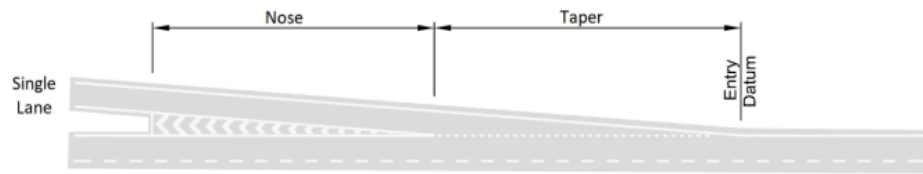
Existing Layout

	Scenario	Layout Type	Lane Configuration			Is Existing Layout Adequate?
			Connector Road	Upstream Mainline	Downstream Mainline	
	Existing Layout	A	1	4	4	
Key	Layout Required					
x	Run 14 AM Peak	D	1	3	4	✓
x	Run 14 Inter Peak	D	1	3	4	✓
x	Run 14 PM Peak	B	1	4	4	✓
o	Run 13 AM Peak	D	1	3	4	✓
o	Run 13 Inter Peak	D	1	3	4	✓
o	Run 13 PM Peak	D	1	3	4	✓
□	Run 8 AM Peak	D	1	3	4	✓
□	Run 8 Inter Peak	D	1	3	4	✓
□	Run 8 PM Peak	D	1	3	4	✓
△	Run 21 AM Peak	A	1	3	3	✓
△	Run 21 Inter Peak	A	1	3	3	✓
△	Run 21 PM Peak	D	1	3	4	✓

KEY

- ✓ Adequate
 x Requires further investigation

Existing Layout CD122 Layout Diagram
Figure 3.14a Layout A option 1 - taper merge

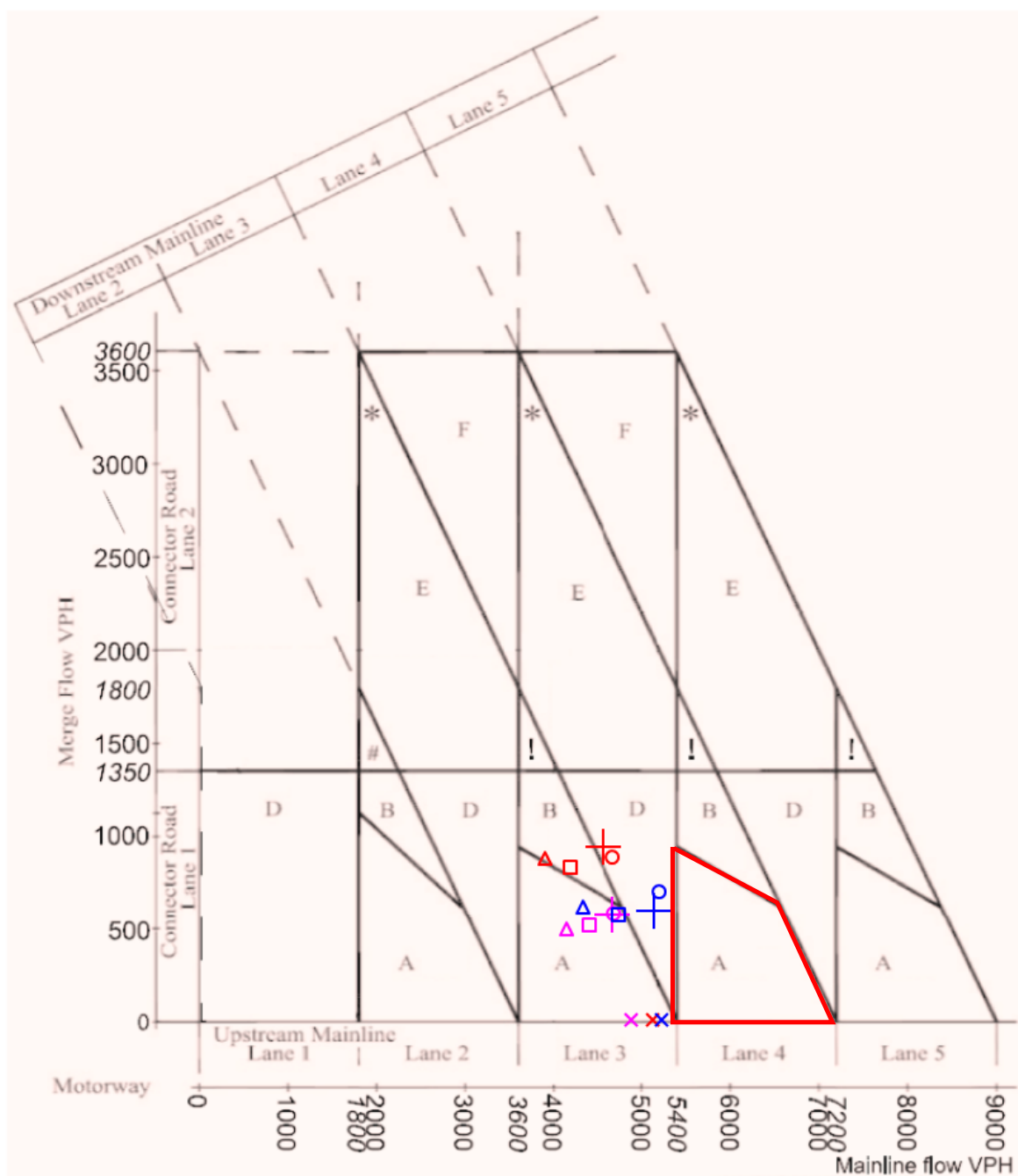


Existing Layout Satellite Image



NGTM Model Fows			
Scenario	Mainline Flow VPH	Merge Flow VPH	Key
Run 10 AM Peak	4591	927	+
Run 10 Inter Peak	4693	564	+
Run 10 PM Peak	5166	585	+
Run 14 AM Peak	5157	0	x
Run 14 Inter Peak	4905	0	x
Run 14 PM Peak	5260	0	x
Run 13 AM Peak	4693	873	o
Run 13 Inter Peak	4712	573	o
Run 13 PM Peak	5220	687	o
Run 8 AM Peak	4216	819	□
Run 8 Inter Peak	4431	508	□
Run 8 PM Peak	4771	564	□
Run 21 AM Peak	3932	870	△
Run 21 Inter Peak	4183	490	△
Run 21 PM Peak	4363	609	△

Figure 3.12b Motorway merging diagram



KEY

Existing Layout

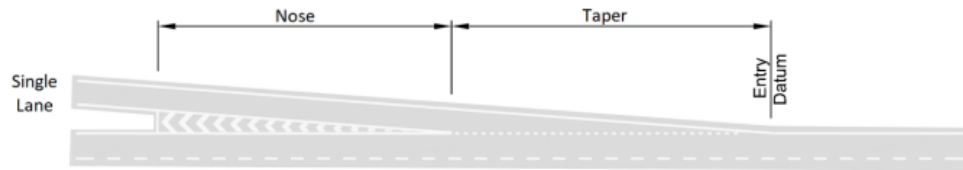
	Scenario	Layout Type	Lane Configuration			Is Existing Layout Adequate?
			Connector Road	Upstream Mainline	Downstream Mainline	
	Existing Layout	A	1	4	4	
Key	Layout Required					
x	Run 14 AM Peak	A	1	3	3	✓
x	Run 14 Inter Peak	A	1	3	3	✓
x	Run 14 PM Peak	A	1	3	3	✓
o	Run 13 AM Peak	D	1	3	4	✓
o	Run 13 Inter Peak	A	1	3	3	✓
o	Run 13 PM Peak	D	1	3	4	✓
□	Run 8 AM Peak	B	1	3	3	✓
□	Run 8 Inter Peak	A	1	3	3	✓
□	Run 8 PM Peak	A	1	3	3	✓
△	Run 21 AM Peak	B	1	3	3	✓
△	Run 21 Inter Peak	A	1	3	3	✓
△	Run 21 PM Peak	A	1	3	3	✓

KEY

- ✓ Adequate
 x Requires further investigation

Existing Layout CD122 Layout Diagram

Figure 3.14a Layout A option 1 - taper merge

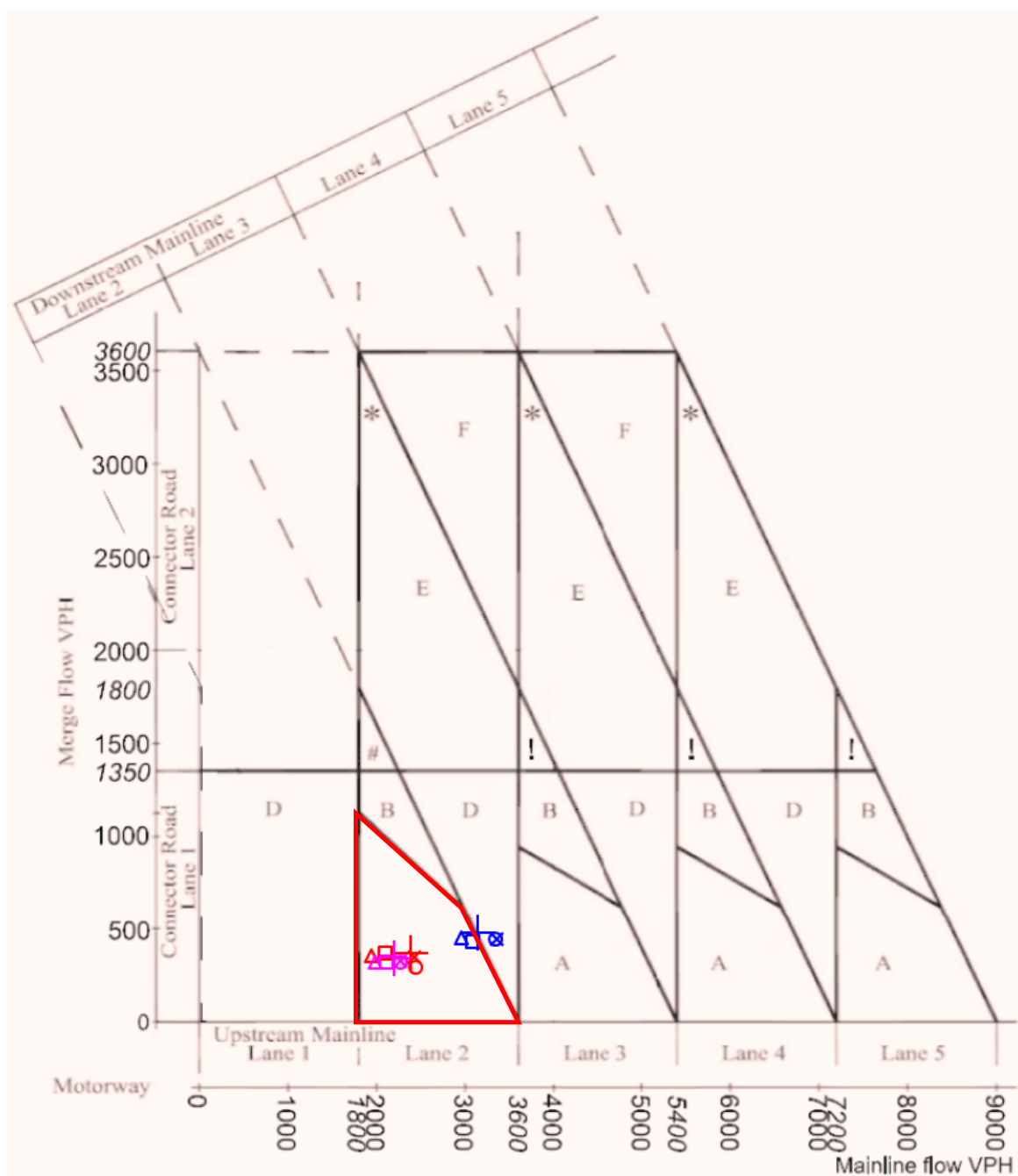


Existing Layout Satellite Image



NGTM Model Fows			
Scenario	Mainline Flow VPH	Merge Flow VPH	Key
Run 10 AM Peak	2416	359	+
Run 10 Inter Peak	2224	331	+
Run 10 PM Peak	3169	470	+
Run 14 AM Peak	2451	338	x
Run 14 Inter Peak	2300	315	x
Run 14 PM Peak	3394	437	x
Run 13 AM Peak	2467	279	o
Run 13 Inter Peak	2305	310	o
Run 13 PM Peak	3381	437	o
Run 8 AM Peak	2134	357	□
Run 8 Inter Peak	2141	312	□
Run 8 PM Peak	3120	423	□
Run 21 AM Peak	1975	341	△
Run 21 Inter Peak	2009	310	△
Run 21 PM Peak	2987	438	△

Figure 3.12b Motorway merging diagram



KEY

Existing Layout

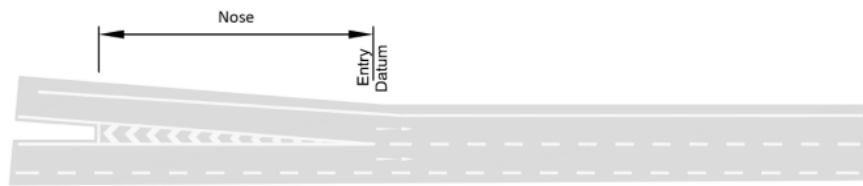
	Scenario	Layout Type	Lane Configuration			Is Existing Layout Adequate?
			Connector Road	Upstream Mainline	Downstream Mainline	
	Existing Layout	A	1	2	2	
Key	Layout Required					
✖	Run 14 AM Peak	A	1	2	2	✓
✖	Run 14 Inter Peak	A	1	2	2	✓
✖	Run 14 PM Peak	D	1	2	3	✖
○	Run 13 AM Peak	A	1	2	2	✓
○	Run 13 Inter Peak	A	1	2	2	✓
○	Run 13 PM Peak	D	1	2	3	✖
□	Run 8 AM Peak	A	1	2	2	✓
□	Run 8 Inter Peak	A	1	2	2	✓
□	Run 8 PM Peak	A	1	2	2	✓
△	Run 21 AM Peak	A	1	2	2	✓
△	Run 21 Inter Peak	A	1	2	2	✓
△	Run 21 PM Peak	A	1	2	2	✓

KEY

- ✓ Adequate
✖ Requires further investigation

Existing Layout CD122 Layout Diagram

Figure 3.14e Layout D - lane gain

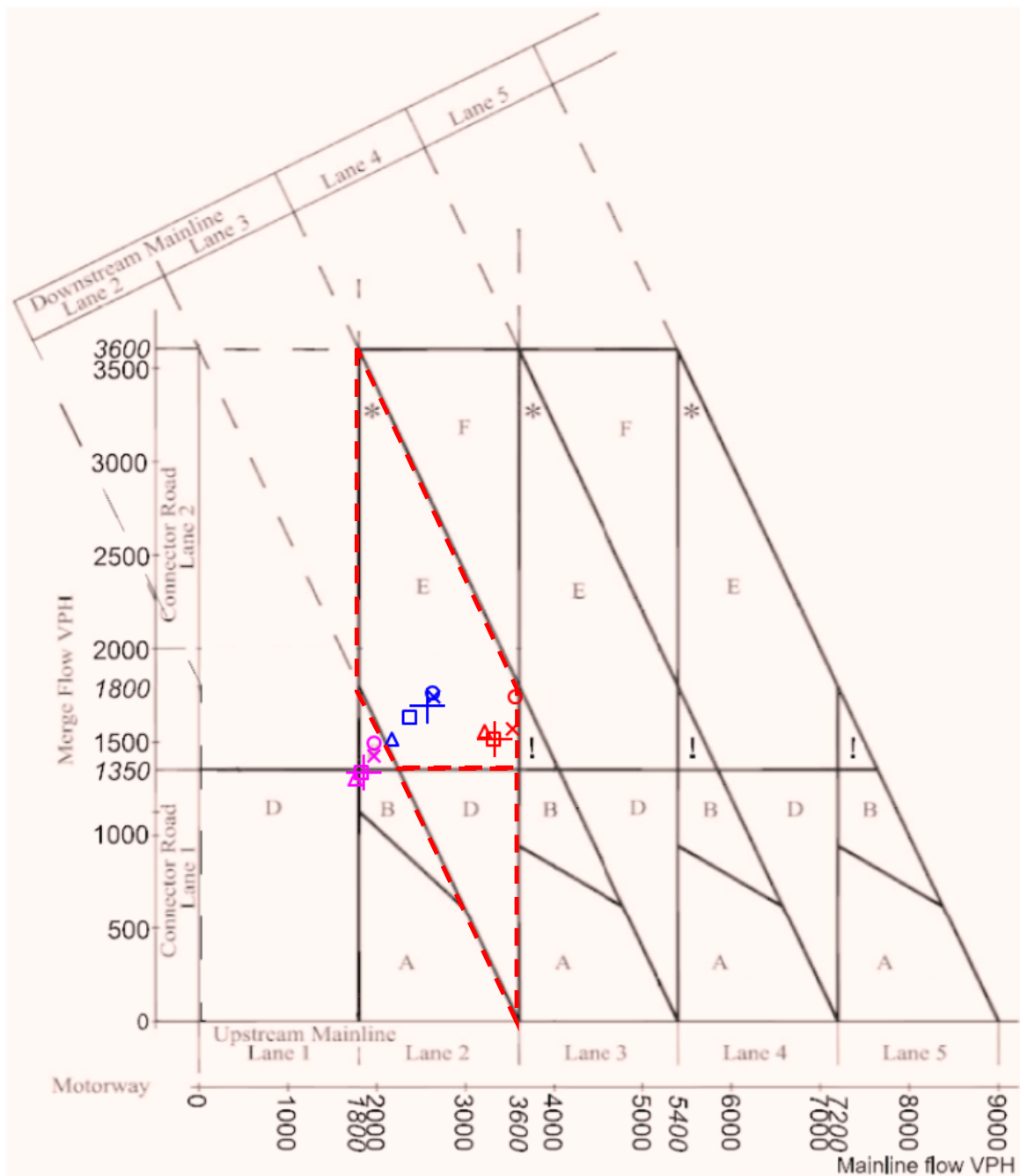


Existing Layout Satellite Image



NGTM Model Fows			
Scenario	Mainline Flow VPH	Merge Flow VPH	Key
Run 10 AM Peak	3360	1504	+
Run 10 Inter Peak	1891	1326	+
Run 10 PM Peak	2600	1681	+
Run 14 AM Peak	3564	1559	x
Run 14 Inter Peak	1995	1413	x
Run 14 PM Peak	2669	1731	x
Run 13 AM Peak	3586	1733	o
Run 13 Inter Peak	1994	1483	o
Run 13 PM Peak	2652	1750	o
Run 8 AM Peak	3343	1502	□
Run 8 Inter Peak	1849	1321	□
Run 8 PM Peak	2402	1618	□
Run 21 AM Peak	3249	1547	△
Run 21 Inter Peak	1783	1287	△
Run 21 PM Peak	2200	1501	△

Figure 3.12b Motorway merging diagram



KEY

Existing Layout

NOTE - NON-STANDARD LAYOUT 2 LANE CONNECTOR ROAD WITH LANE GAIN BUT NO GHOST ISLAND AT MERGE. CAPACITY LIKELY TO BE NEARER TO 2 LANE CONNECTOR ROAD WITH LAYOUT E. WARRANTS FURTHER DETAILED ASSESSMENT

	Scenario	Layout Type	Lane Configuration			Is Existing Layout Adequate?
			Connector Road	Upstream Mainline	Downstream Mainline	
	Existing Layout	D/E	1	2	3	
Key	Layout Required					
x	Run 14 AM Peak	E	2	2	3	✓ *
x	Run 14 Inter Peak	E	2	2	2	✓ *
x	Run 14 PM Peak	E	2	2	3	✓ *
o	Run 13 AM Peak	E	2	2	3	✓ *
o	Run 13 Inter Peak	E	2	2	2	✓ *
o	Run 13 PM Peak	E	2	2	3	✓ *
□	Run 8 AM Peak	E	2	2	3	✓ *
□	Run 8 Inter Peak	B	1	2	2	✓
□	Run 8 PM Peak	E	2	2	3	✓ *
Δ	Run 21 AM Peak	E	2	2	3	✓ *
Δ	Run 21 Inter Peak	D	1	1	2	✓
Δ	Run 21 PM Peak	E	2	2	3	✓ *

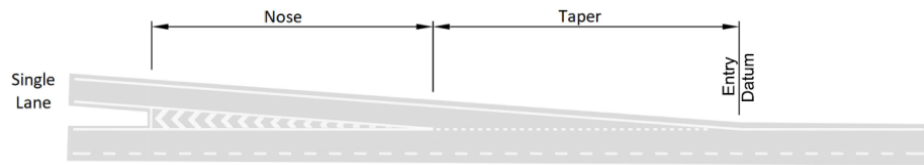
KEY

- ✓ Adequate
 * Requires further investigation

* NOTE - BASED ON JUDGEMENT THAT CAPACITY OF NON-STANDARD LAYOUT IS LIKELY TO BE CLOSER TO 2 LANE APPROACH WITH LAYOUT E

Existing Layout CD122 Layout Diagram

Figure 3.14a Layout A option 1 - taper merge

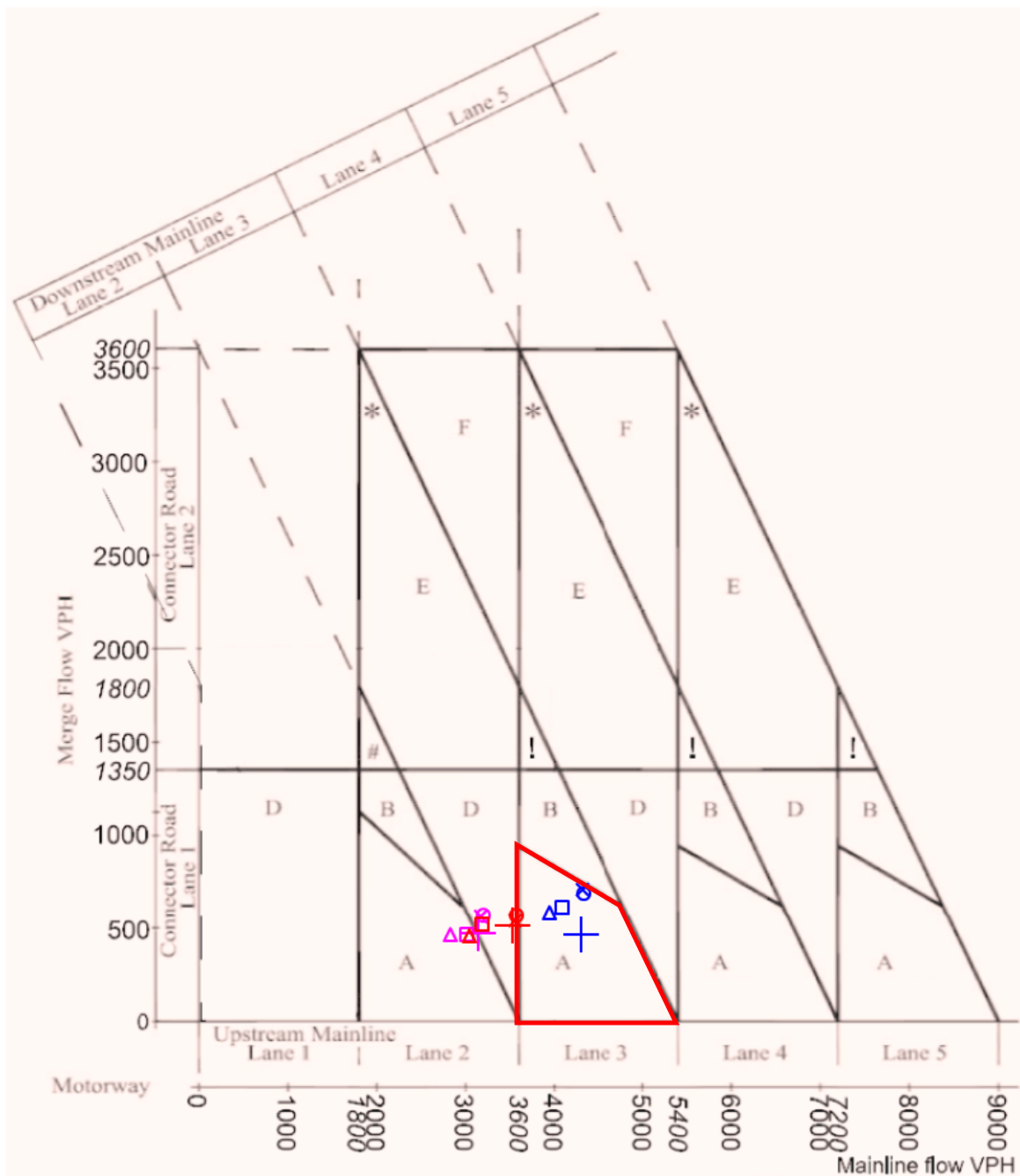


Existing Layout Satellite Image



NGTM Model Fows			
Scenario	Mainline Flow VPH	Merge Flow VPH	Key
Run 10 AM Peak	3566	501	+
Run 10 Inter Peak	3169	460	+
Run 10 PM Peak	4343	452	+
Run 14 AM Peak	3593	532	x
Run 14 Inter Peak	3202	554	x
Run 14 PM Peak	4357	696	x
Run 13 AM Peak	3603	556	o
Run 13 Inter Peak	3238	557	o
Run 13 PM Peak	4370	676	o
Run 8 AM Peak	3222	511	□
Run 8 Inter Peak	3042	451	□
Run 8 PM Peak	4123	597	□
Run 21 AM Peak	3079	446	△
Run 21 Inter Peak	2866	453	△
Run 21 PM Peak	3985	572	△

Figure 3.12b Motorway merging diagram



KEY

Existing Layout

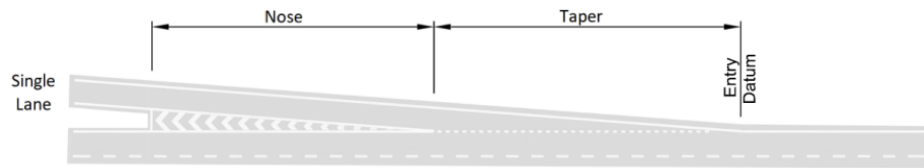
	Scenario	Layout Type	Lane Configuration			Is Existing Layout Adequate?
			Connector Road	Upstream Mainline	Downstream Mainline	
	Existing Layout	A	1	3	3	
Key	Layout Required					
✖	Run 14 AM Peak	D	1	2	3	✓
✖	Run 14 Inter Peak	D	1	2	3	✓
✖	Run 14 PM Peak	A	1	3	3	✓
○	Run 13 AM Peak	A	1	3	3	✓
○	Run 13 Inter Peak	D	1	2	3	✓
○	Run 13 PM Peak	A	1	3	3	✓
□	Run 8 AM Peak	D	1	2	3	✓
□	Run 8 Inter Peak	A	1	2	2	✓
□	Run 8 PM Peak	A	1	3	3	✓
△	Run 21 AM Peak	A	1	2	2	✓
△	Run 21 Inter Peak	A	1	2	2	✓
△	Run 21 PM Peak	A	1	3	3	✓

KEY

- ✓ Adequate
✖ Requires further investigation

Existing Layout CD122 Layout Diagram

Figure 3.14a Layout A option 1 - taper merge

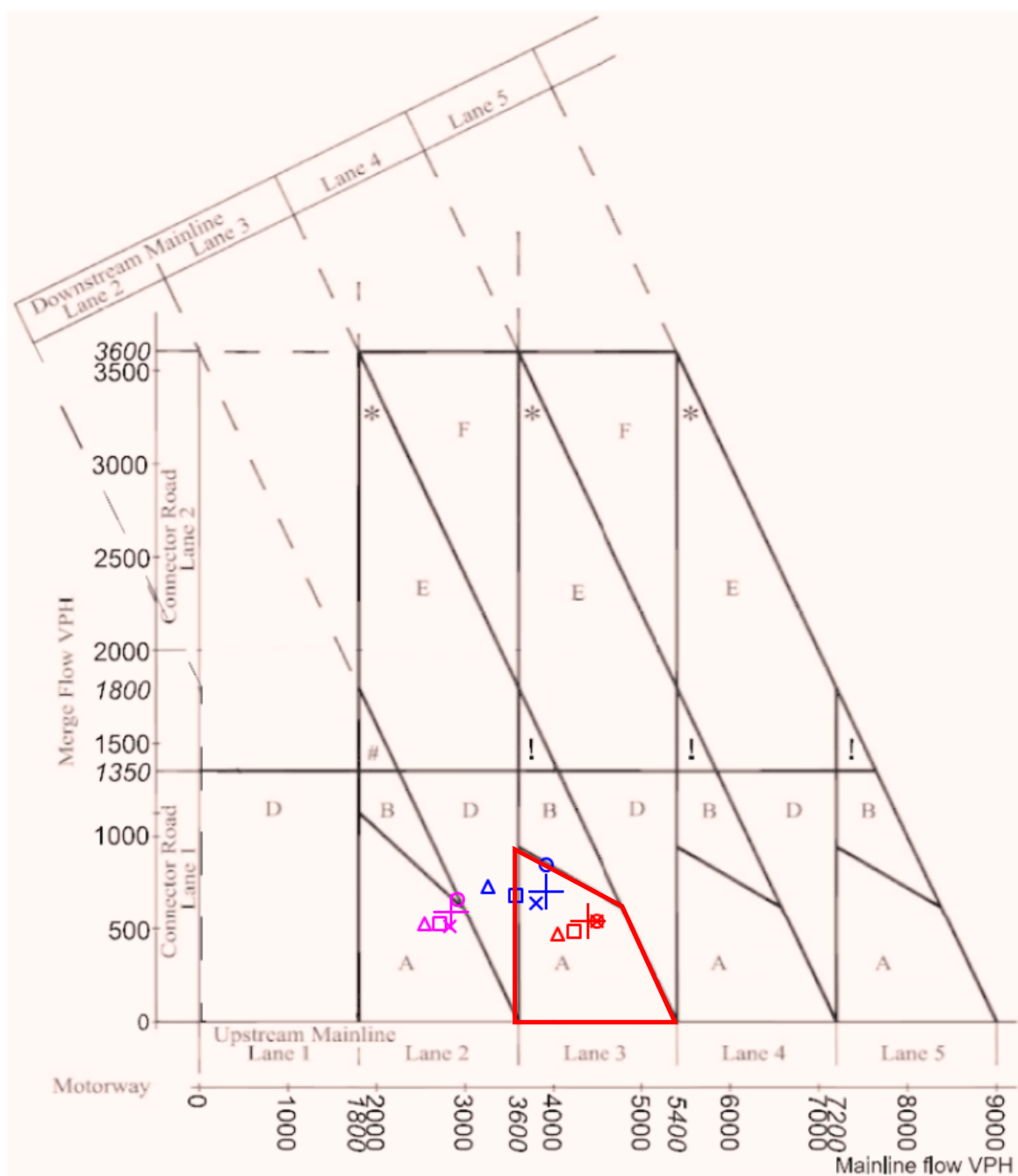


Existing Layout Satellite Image



NGTM Model Fows			
Scenario	Mainline Flow VPH	Merge Flow VPH	Key
Run 10 AM Peak	4425	528	+
Run 10 Inter Peak	2871	578	+
Run 10 PM Peak	3953	692	+
Run 14 AM Peak	4516	530	x
Run 14 Inter Peak	2855	506	x
Run 14 PM Peak	3840	627	x
Run 13 AM Peak	4522	528	o
Run 13 Inter Peak	2951	647	o
Run 13 PM Peak	3952	831	o
Run 8 AM Peak	4266	474	□
Run 8 Inter Peak	2740	516	□
Run 8 PM Peak	3605	665	□
Run 21 AM Peak	4073	462	△
Run 21 Inter Peak	2572	514	△
Run 21 PM Peak	3288	718	△

Figure 3.12b Motorway merging diagram



KEY

Existing Layout

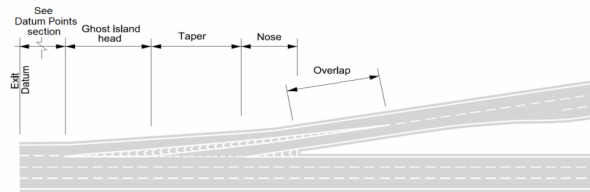
	Scenario	Layout Type	Lane Configuration			Is Existing Layout Adequate?
			Connector Road	Upstream Mainline	Downstream Mainline	
	Existing Layout	A	1	3	3	
Key	Layout Required					
x	Run 14 AM Peak	A	1	3	3	✓
x	Run 14 Inter Peak	A	1	2	2	✓
x	Run 14 PM Peak	A	1	3	3	✓
o	Run 13 AM Peak	A	1	3	3	✓
o	Run 13 Inter Peak	B	1	2	2	✓
o	Run 13 PM Peak	A	1	3	3	✓
□	Run 8 AM Peak	A	1	3	3	✓
□	Run 8 Inter Peak	A	1	2	2	✓
□	Run 8 PM Peak	A	1	3	3	✓
△	Run 21 AM Peak	A	1	3	3	✓
△	Run 21 Inter Peak	A	1	2	2	✓
△	Run 21 PM Peak	D	1	2	3	✓

KEY

- ✓ Adequate
 x Requires further investigation

Existing Layout CD122 Layout Diagram

Figure 3.30j Layout F - mainline lane drop and ghost island diverge

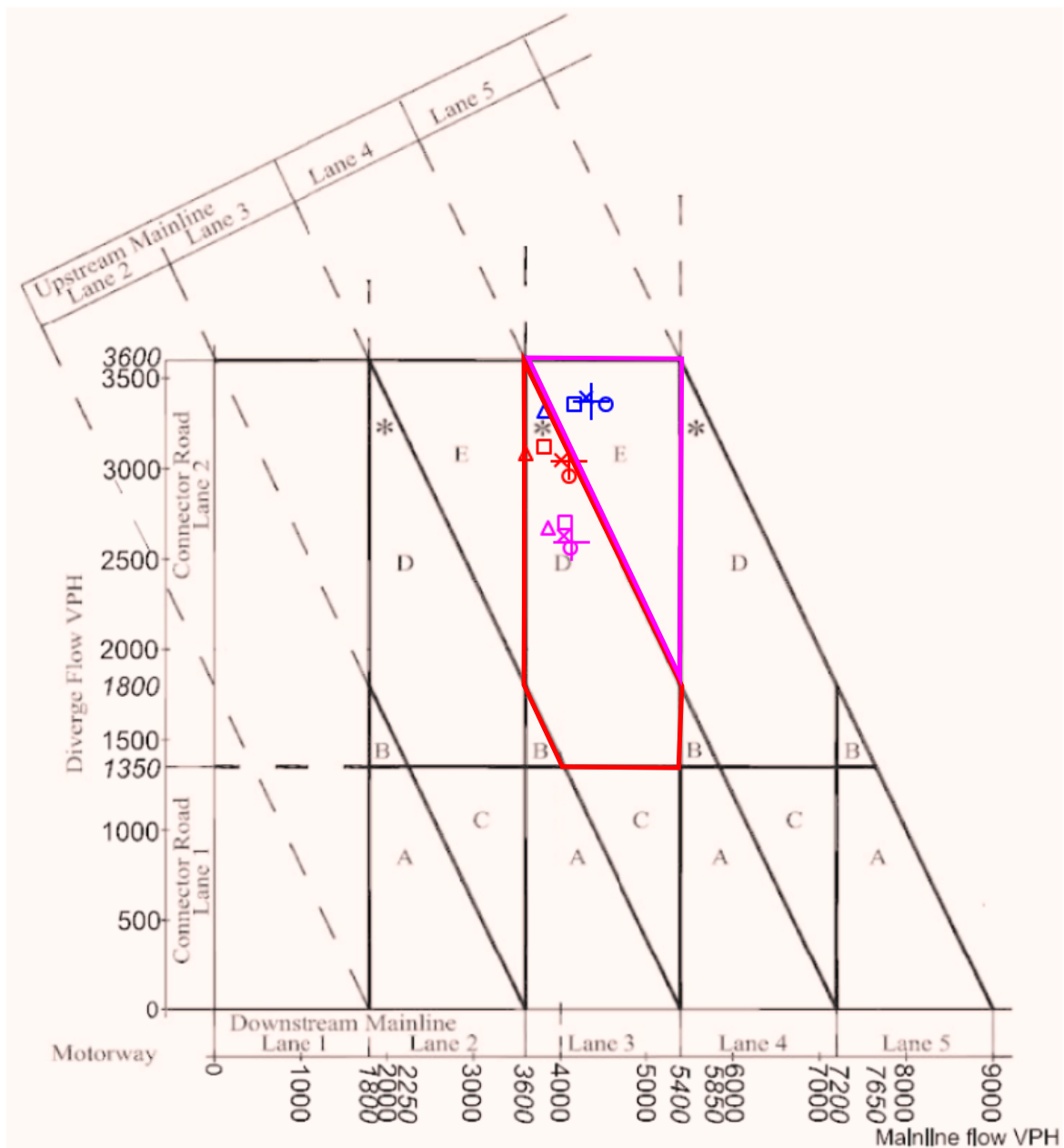


Existing Layout Satellite Image



NGTM Model Fows			
Scenario	Mainline Flow VPH	Diverge Flow VPH	Key
Run 10 AM Peak	4130	3037	+
Run 10 Inter Peak	4162	2590	+
Run 10 PM Peak	4393	3369	+
Run 14 AM Peak	4031	3046	x
Run 14 Inter Peak	4069	2630	x
Run 14 PM Peak	4333	3396	x
Run 13 AM Peak	4125	2962	o
Run 13 Inter Peak	4141	2564	o
Run 13 PM Peak	4557	3359	o
Run 8 AM Peak	3833	3119	□
Run 8 Inter Peak	4083	2698	□
Run 8 PM Peak	4184	3358	□
Run 21 AM Peak	3634	3082	△
Run 21 Inter Peak	3887	2668	△
Run 21 PM Peak	3835	3317	△

Figure 3.26b Motorway diverging diagram



KEY



Existing Layout

DCO Scheme Layout

NOTE - LAYOUT F NOT ANNOTATED ON PLOT IN CD122. LAYOUT F PROVIDES GREATER DIVERGING CAPACITY THAN LAYOUT D

	Scenario	Layout Type	Lane Configuration			Is Existing Layout Adequate?
			Connector Road	Upstream Mainline	Downstream Mainline	
	Existing Layout	F	2	4	3	
Key	Layout Required					
x	Run 14 AM Peak	D	2	4	3	✓
x	Run 14 Inter Peak	D	2	4	3	✓
x	Run 14 PM Peak	E	2	5	3	✓
o	Run 13 AM Peak	D	2	4	3	✓
o	Run 13 Inter Peak	D	2	4	3	✓
o	Run 13 PM Peak	E	2	5	3	✓
□	Run 8 AM Peak	D	2	4	3	✓
□	Run 8 Inter Peak	D	2	4	3	✓
□	Run 8 PM Peak	E	2	5	3	✓
△	Run 21 AM Peak	D	2	4	3	✓
△	Run 21 Inter Peak	D	2	4	3	✓
△	Run 21 PM Peak	D	2	4	3	✓

KEY

✓

Adequate

x

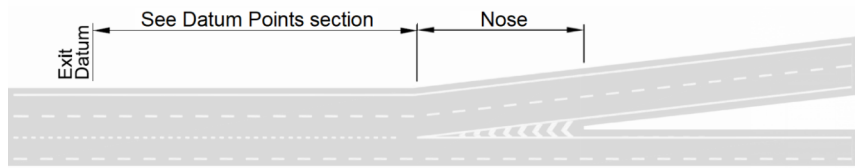
Requires further investigation

✓

DCO Scheme provides sufficient capacity

Existing Layout CD122 Layout Diagram

Figure 3.30i Layout E - 2-lane drop

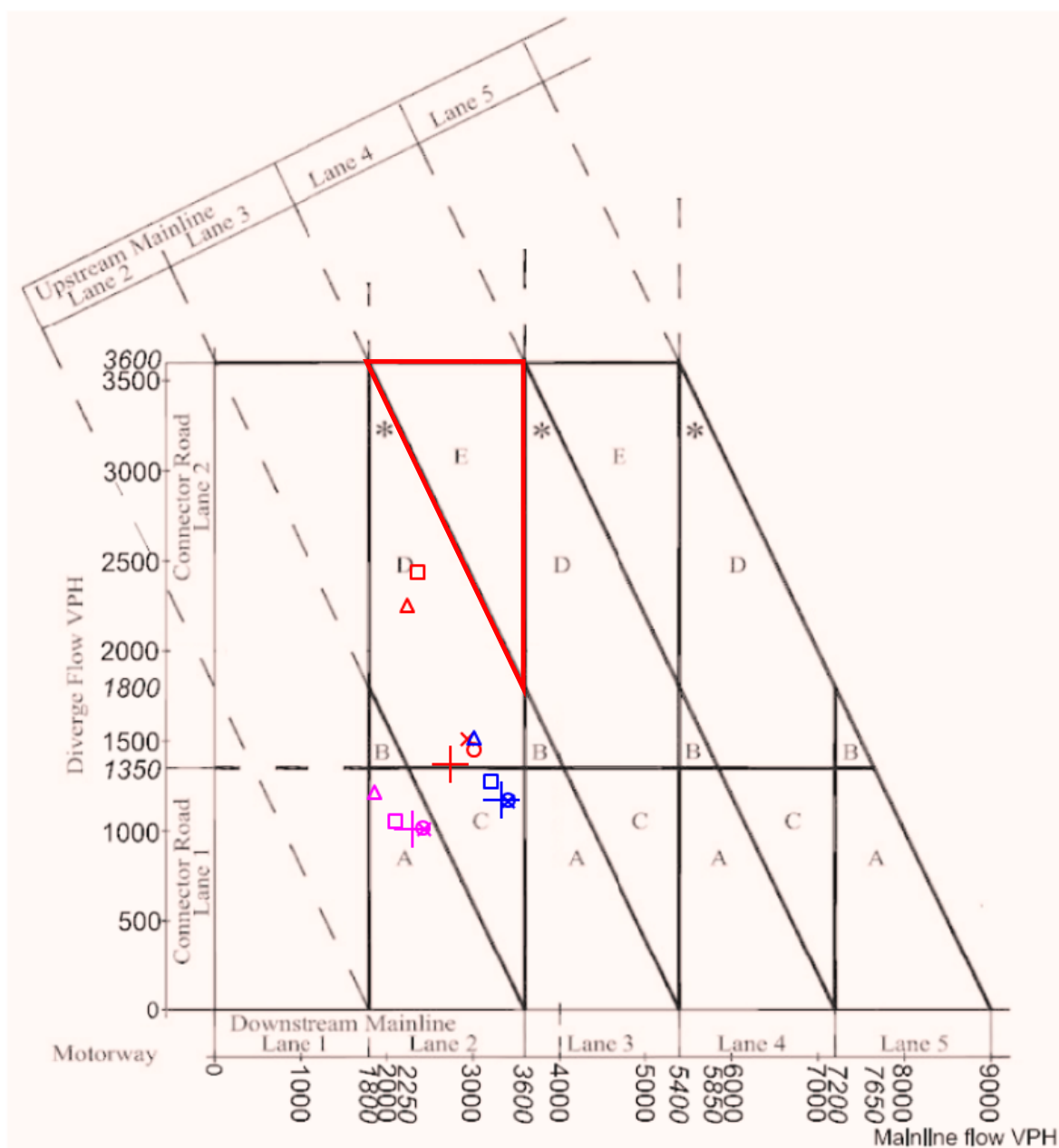


Existing Layout Satellite Image



NGTM Model Fows			
Scenario	Mainline Flow VPH	Diverge Flow VPH	Key
Run 10 AM Peak	2759	1372	+
Run 10 Inter Peak	2319	1011	+
Run 10 PM Peak	3354	1169	+
Run 14 AM Peak	2956	1511	x
Run 14 Inter Peak	2453	1008	x
Run 14 PM Peak	3431	1160	x
Run 13 AM Peak	3037	1450	o
Run 13 Inter Peak	2438	1017	o
Run 13 PM Peak	3434	1172	o
Run 8 AM Peak	2385	2436	□
Run 8 Inter Peak	2126	1052	□
Run 8 PM Peak	3228	1274	□
Run 21 AM Peak	2260	2253	△
Run 21 Inter Peak	1874	1214	△
Run 21 PM Peak	3027	1513	△

Figure 3.26b Motorway diverging diagram



KEY

Existing Layout

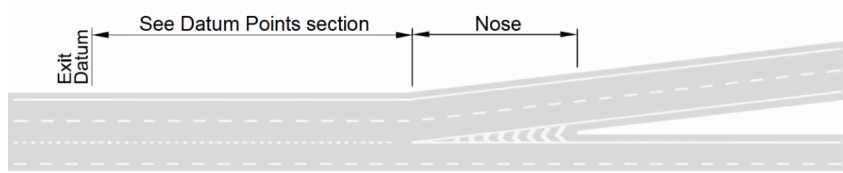
	Scenario	Layout Type	Lane Configuration			Is Existing Layout Adequate?
			Connector Road	Upstream Mainline	Downstream Mainline	
	Existing Layout	E	3	4	2	
Key	Layout Required					
✗	Run 14 AM Peak	D	2	3	2	✓
✗	Run 14 Inter Peak	A	1	2	2	✓
✗	Run 14 PM Peak	C	1	3	2	✓
○	Run 13 AM Peak	D	2	3	2	✓
○	Run 13 Inter Peak	A	1	2	2	✓
○	Run 13 PM Peak	C	1	3	2	✓
□	Run 8 AM Peak	D	2	3	2	✓
□	Run 8 Inter Peak	A	1	2	2	✓
□	Run 8 PM Peak	C	1	3	2	✓
△	Run 21 AM Peak	D	2	3	2	✓
△	Run 21 Inter Peak	A	1	2	2	✓
△	Run 21 PM Peak	D	2	3	2	✓

KEY

- ✓ Adequate
✗ Requires further investigation

Existing Layout CD122 Layout Diagram

Figure 3.30i Layout E - 2-lane drop

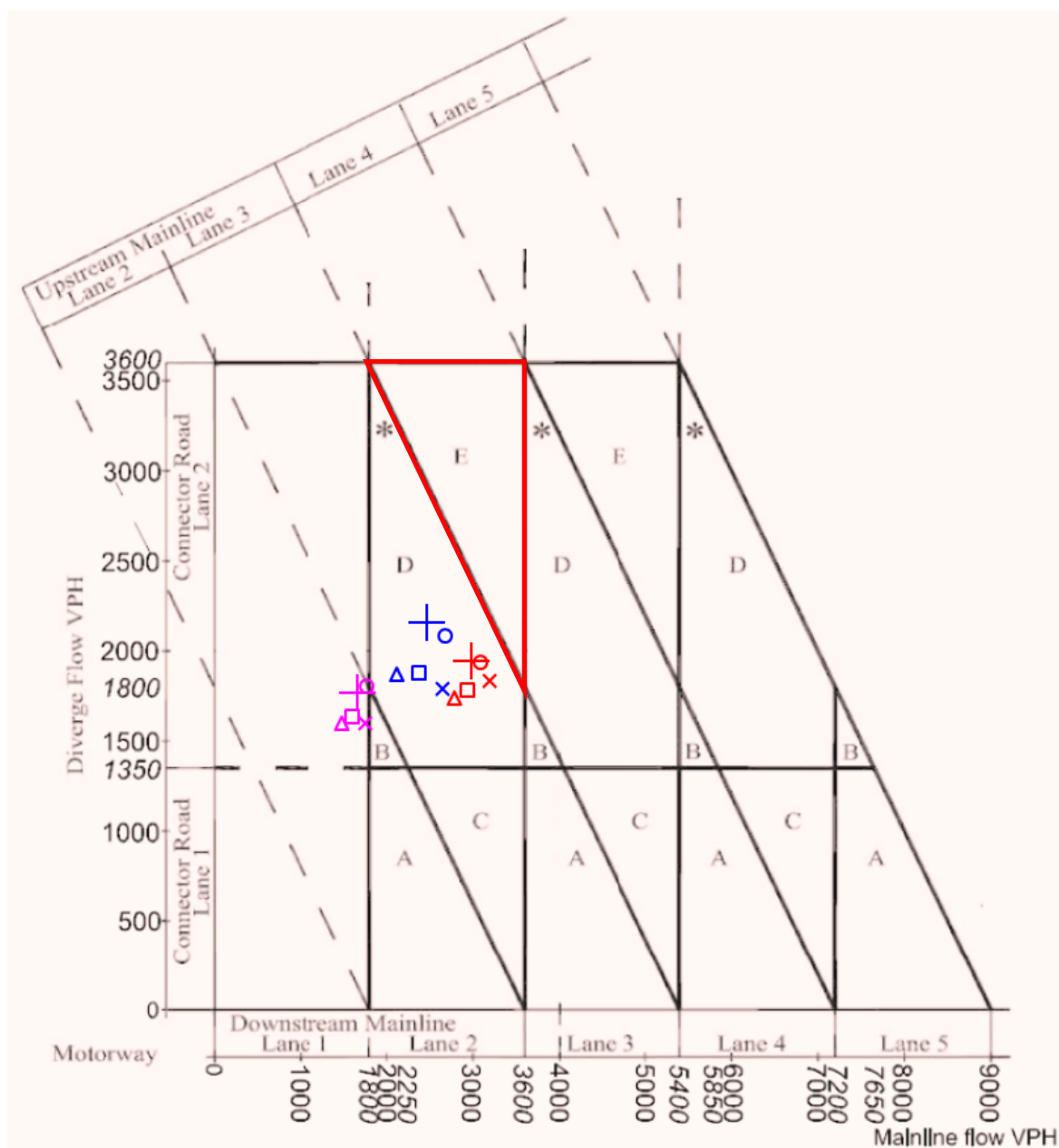


Existing Layout Satellite Image



NGTM Model Fows			
Scenario	Mainline Flow VPH	Diverge Flow VPH	Key
Run 10 AM Peak	3010	1942	+
Run 10 Inter Peak	1686	1763	+
Run 10 PM Peak	2492	2153	+
Run 14 AM Peak	3216	1829	x
Run 14 Inter Peak	1764	1597	x
Run 14 PM Peak	2675	1792	x
Run 13 AM Peak	3109	1936	o
Run 13 Inter Peak	1792	1806	o
Run 13 PM Peak	2696	2083	o
Run 8 AM Peak	2962	1779	□
Run 8 Inter Peak	1623	1633	□
Run 8 PM Peak	2397	1874	□
Run 21 AM Peak	2799	1737	△
Run 21 Inter Peak	1489	1598	△
Run 21 PM Peak	2140	1866	△

Figure 3.26b Motorway diverging diagram



KEY

Existing Layout

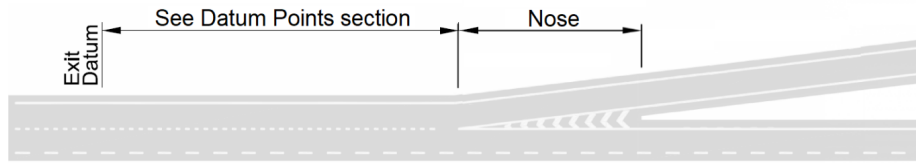
	Scenario	Layout Type	Lane Configuration			Is Existing Layout Adequate?
			Connector Road	Upstream Mainline	Downstream Mainline	
	Existing Layout	E	2	4	2	
Key	Layout Required					
✗	Run 14 AM Peak	D	2	3	2	✓
✗	Run 14 Inter Peak	B	2	2	1	✓
✗	Run 14 PM Peak	D	2	3	2	✓
○	Run 13 AM Peak	D	2	3	2	✓
○	Run 13 Inter Peak	B	2	2	1	✓
○	Run 13 PM Peak	D	2	3	2	✓
□	Run 8 AM Peak	D	2	3	2	✓
□	Run 8 Inter Peak	B	2	2	1	✓
□	Run 8 PM Peak	D	2	3	2	✓
△	Run 21 AM Peak	D	2	3	2	✓
△	Run 21 Inter Peak	B	2	2	1	✓
△	Run 21 PM Peak	D	2	3	2	✓

KEY

- ✓ Adequate
✗ Requires further investigation

Existing Layout CD122 Layout Diagram

Figure 3.30e Layout C Option 1 - lane drop with 1-lane connector road



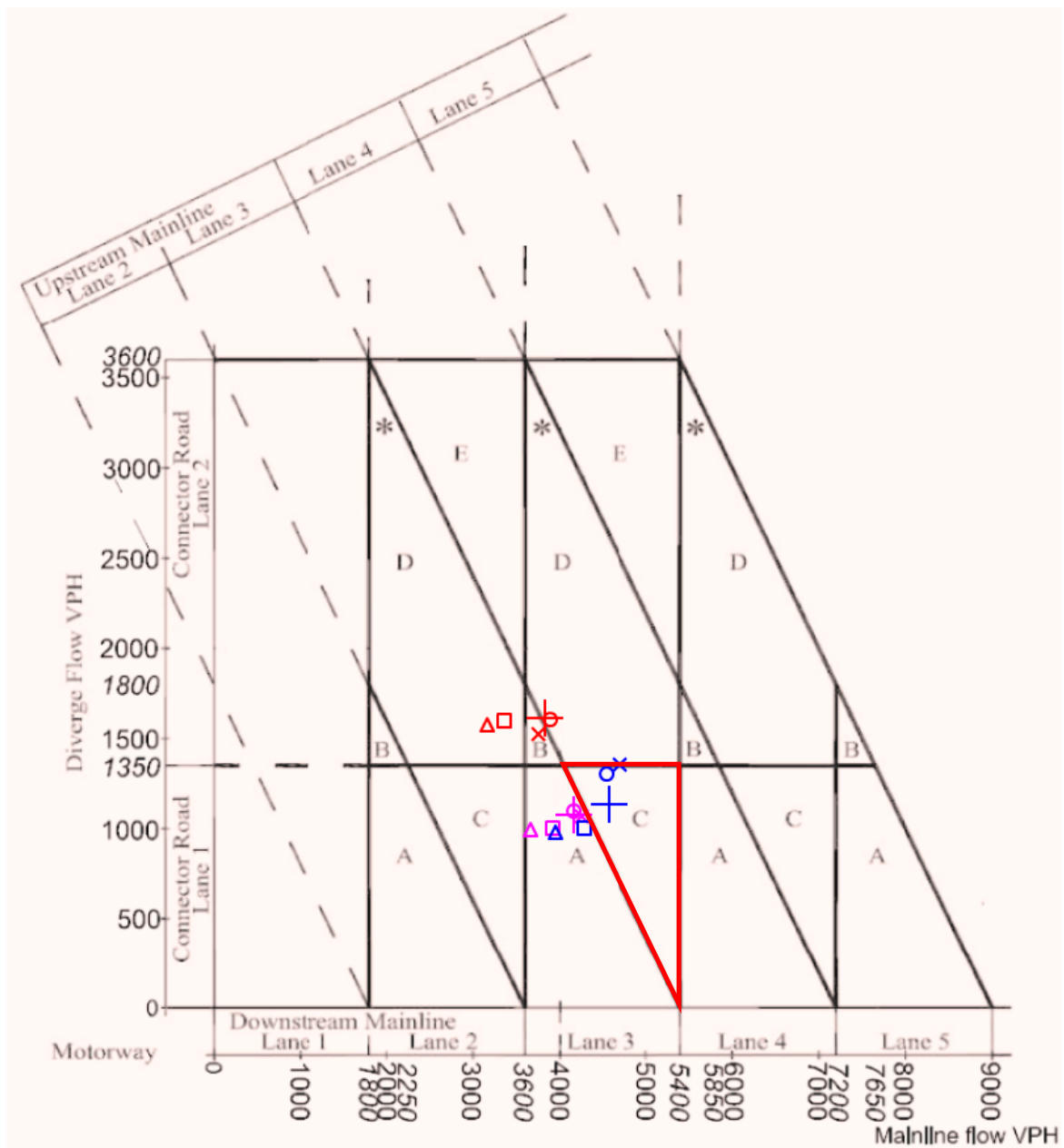
Existing Layout Satellite Image



NGTM Model Fows

Scenario	Mainline Flow VPH	Diverge Flow VPH	Key
Run 10 AM Peak	3855	1614	+
Run 10 Inter Peak	4191	1072	+
Run 10 PM Peak	4597	1133	+
Run 14 AM Peak	3783	1527	x
Run 14 Inter Peak	4280	1067	x
Run 14 PM Peak	4726	1352	x
Run 13 AM Peak	3914	1607	o
Run 13 Inter Peak	4192	1099	o
Run 13 PM Peak	4578	1305	o
Run 8 AM Peak	3390	1598	□
Run 8 Inter Peak	3945	1000	□
Run 8 PM Peak	4315	1001	□
Run 21 AM Peak	3193	1577	△
Run 21 Inter Peak	3694	991	△
Run 21 PM Peak	3982	978	△

Figure 3.26b Motorway diverging diagram

**KEY**

Existing Layout

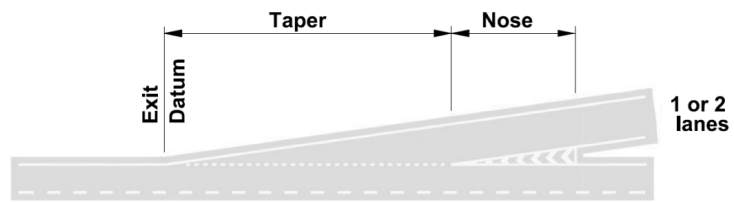
	Scenario	Layout Type	Lane Configuration			Is Existing Layout Adequate?
			Connector Road	Upstream Mainline	Downstream Mainline	
	Existing Layout	C	1	4	3	
Key	Layout Required					
✖	Run 14 AM Peak	B	2	3	3	✖
✖	Run 14 Inter Peak	A	1	3	3	✓
✖	Run 14 PM Peak	D	2	4	3	✖
○	Run 13 AM Peak	D	2	4	3	✖
○	Run 13 Inter Peak	A	1	3	3	✓
○	Run 13 PM Peak	C	1	4	3	✓
□	Run 8 AM Peak	D	2	3	2	✖
□	Run 8 Inter Peak	A	1	3	3	✓
□	Run 8 PM Peak	A	1	3	3	✓
△	Run 21 AM Peak	D	2	3	2	✖
△	Run 21 Inter Peak	A	1	3	3	✓
△	Run 21 PM Peak	A	1	3	3	✓

KEY

- ✓ Adequate
✖ Requires further investigation

Existing Layout CD122 Layout Diagram

Figure 3.30a Layout A option 1 - taper diverge

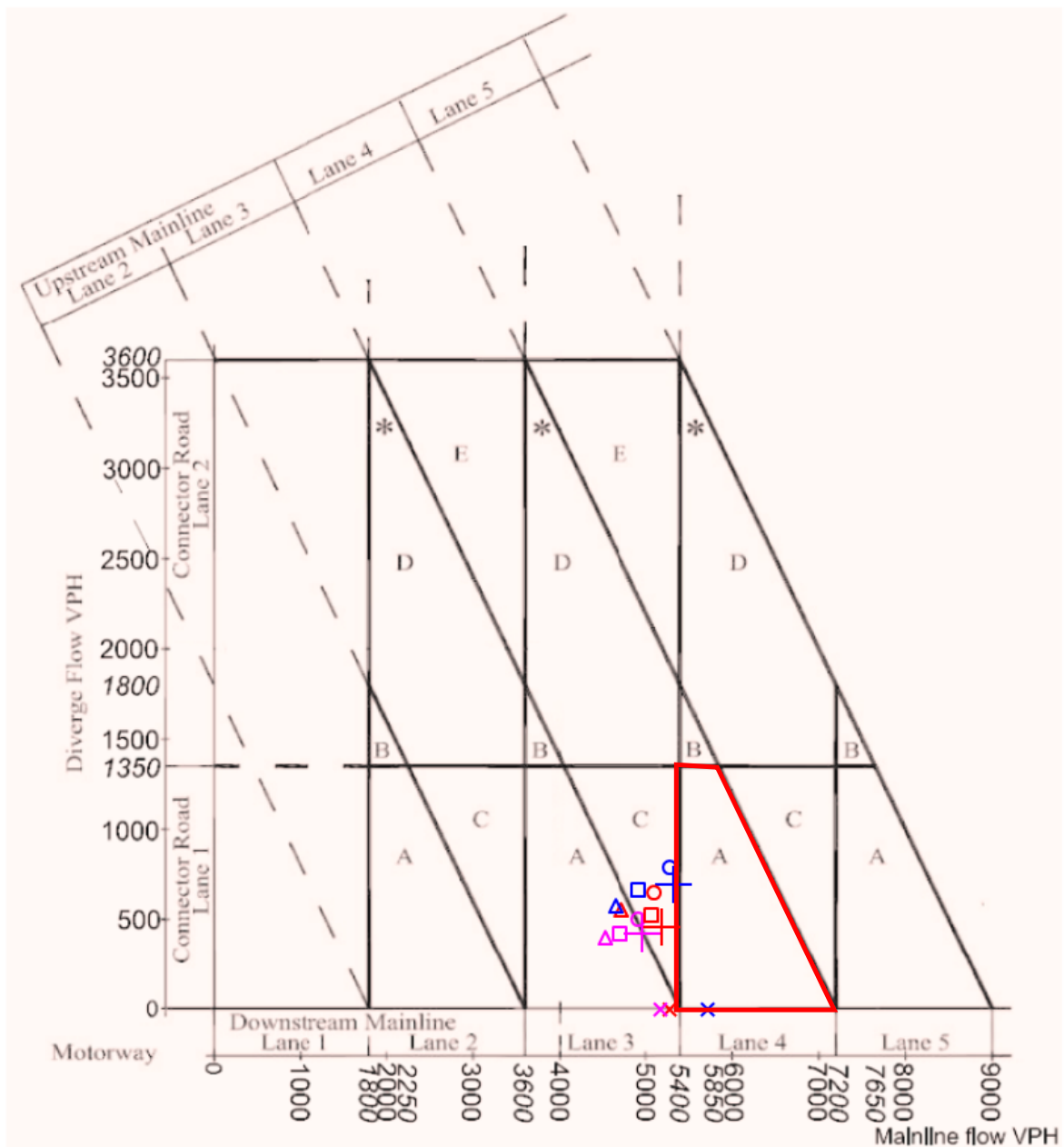


Existing Layout Satellite Image



NGTM Model Fows			
Scenario	Mainline Flow VPH	Diverge Flow VPH	Key
Run 10 AM Peak	5203	458	+
Run 10 Inter Peak	4985	423	+
Run 10 PM Peak	5348	689	+
Run 14 AM Peak	5308	0	x
Run 14 Inter Peak	5201	0	x
Run 14 PM Peak	5746	0	x
Run 13 AM Peak	5125	644	o
Run 13 Inter Peak	4940	499	o
Run 13 PM Peak	5299	784	o
Run 8 AM Peak	5082	522	□
Run 8 Inter Peak	4727	422	□
Run 8 PM Peak	4930	659	□
Run 21 AM Peak	4732	549	△
Run 21 Inter Peak	4550	400	△
Run 21 PM Peak	4679	577	△

Figure 3.26b Motorway diverging diagram



KEY

Existing Layout

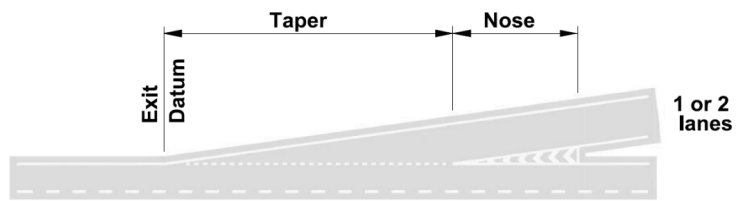
	Scenario	Layout Type	Lane Configuration			Is Existing Layout Adequate?
			Connector Road	Upstream Mainline	Downstream Mainline	
	Existing Layout	A	1	4	4	
Key	Layout Required					
x	Run 14 AM Peak	N/A	N/A	N/A	N/A	N/A
x	Run 14 Inter Peak	N/A	N/A	N/A	N/A	N/A
x	Run 14 PM Peak	N/A	N/A	N/A	N/A	N/A
o	Run 13 AM Peak	C	1	4	3	✓
o	Run 13 Inter Peak	C	1	4	3	✓
o	Run 13 PM Peak	C	1	4	3	✓
□	Run 8 AM Peak	C	1	4	3	✓
□	Run 8 Inter Peak	A	1	3	3	✓
□	Run 8 PM Peak	C	1	4	3	✓
△	Run 21 AM Peak	A	1	3	3	✓
△	Run 21 Inter Peak	A	1	3	3	✓
△	Run 21 PM Peak	A	1	3	3	✓

KEY

- ✓ Adequate
 x Requires further investigation

Existing Layout CD122 Layout Diagram

Figure 3.30a Layout A option 1 - taper diverge



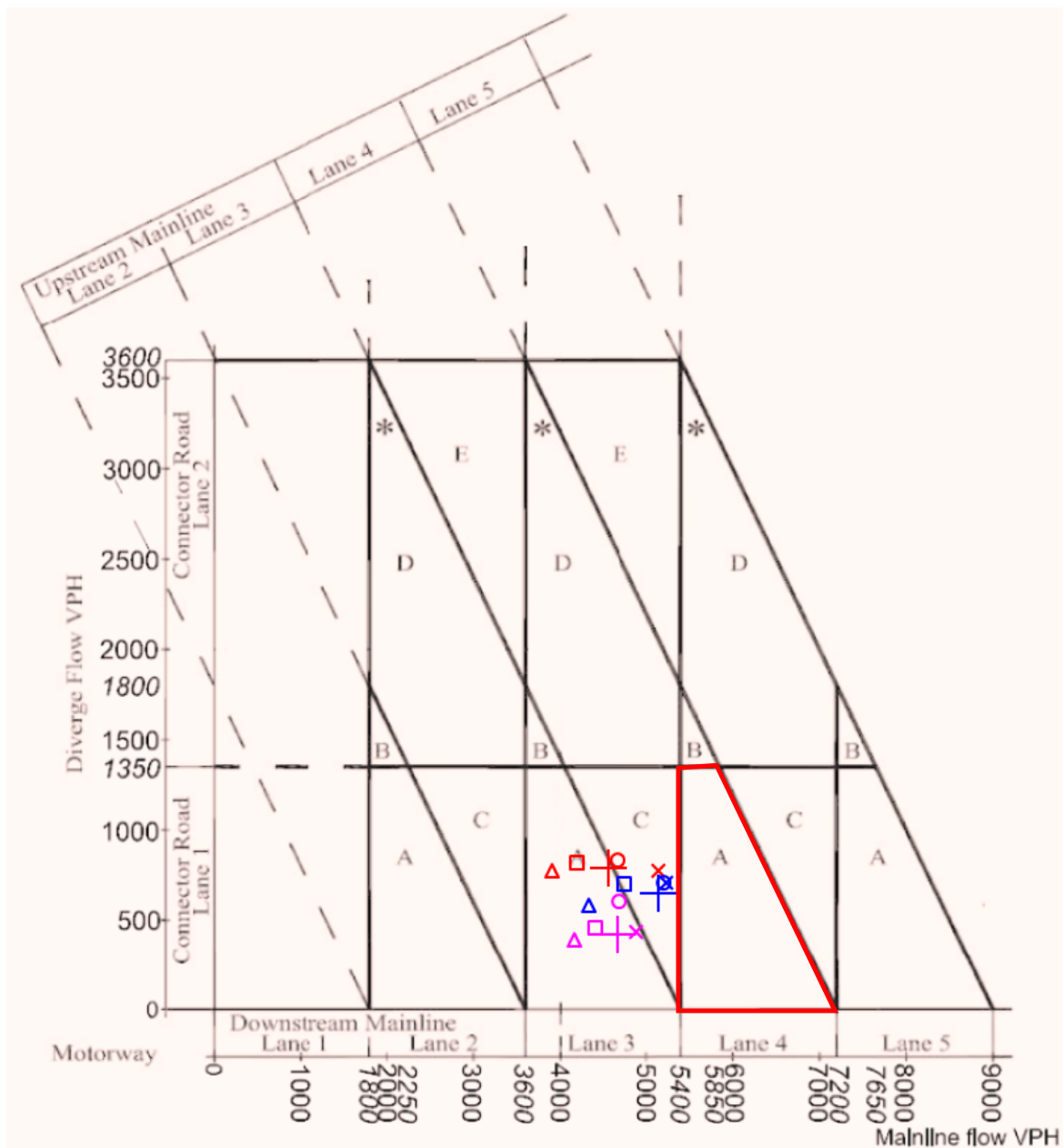
Existing Layout Satellite Image



NGTM Model Fows

Scenario	Mainline Flow VPH	Diverge Flow VPH	Key
Run 10 AM Peak	4591	785	+
Run 10 Inter Peak	4693	420	+
Run 10 PM Peak	5166	644	+
Run 14 AM Peak	5157	772	x
Run 14 Inter Peak	4905	431	x
Run 14 PM Peak	5260	710	x
Run 13 AM Peak	4693	834	o
Run 13 Inter Peak	4712	603	o
Run 13 PM Peak	5220	709	o
Run 8 AM Peak	4216	819	□
Run 8 Inter Peak	4431	456	□
Run 8 PM Peak	4771	698	□
Run 21 AM Peak	3932	776	△
Run 21 Inter Peak	4183	390	△
Run 21 PM Peak	4363	578	△

Figure 3.26b Motorway diverging diagram

**KEY**

Existing Layout

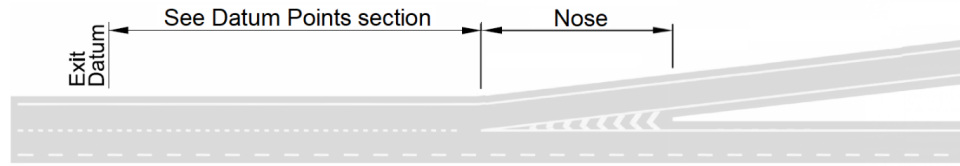
	Scenario	Layout Type	Lane Configuration			Is Existing Layout Adequate?
			Connector Road	Upstream Mainline	Downstream Mainline	
	Existing Layout	A	1	4	4	
Key	Layout Required					
✗	Run 14 AM Peak	C	1	4	3	✓
✗	Run 14 Inter Peak	A	1	3	3	✓
✗	Run 14 PM Peak	C	1	4	3	✓
○	Run 13 AM Peak	C	1	4	3	✓
○	Run 13 Inter Peak	A	1	3	3	✓
○	Run 13 PM Peak	C	1	4	3	✓
□	Run 8 AM Peak	A	1	3	3	✓
□	Run 8 Inter Peak	A	1	3	3	✓
□	Run 8 PM Peak	C	1	4	3	✓
△	Run 21 AM Peak	A	1	3	3	✓
△	Run 21 Inter Peak	A	1	3	3	✓
△	Run 21 PM Peak	A	1	3	3	✓

KEY

- ✓ Adequate
✗ Requires further investigation

Existing Layout CD122 Layout Diagram

Figure 3.30e Layout C Option 1 - lane drop with 1-lane connector road

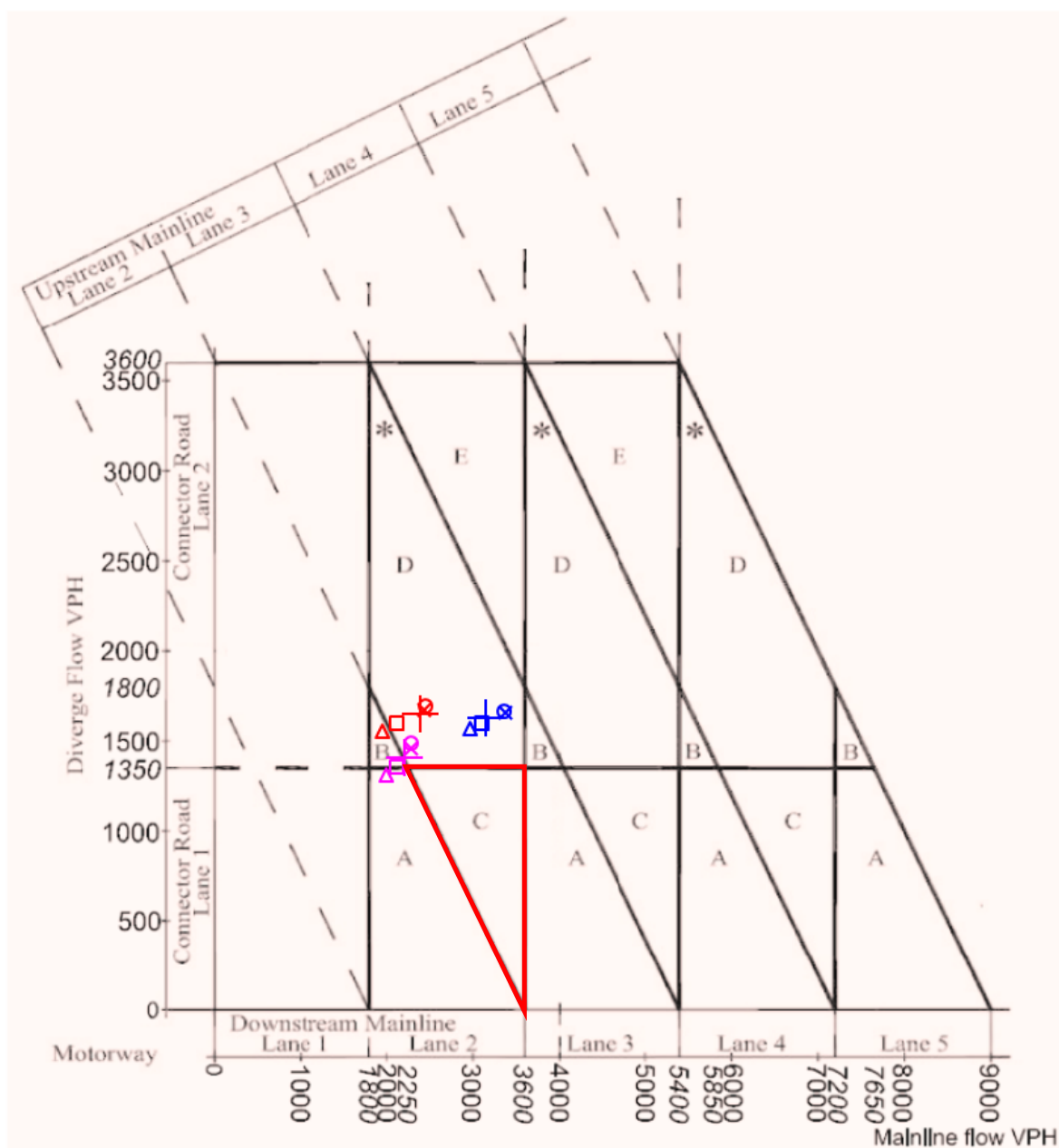


Existing Layout Satellite Image



NGTM Model Fows			
Scenario	Mainline Flow VPH	Diverge Flow VPH	Key
Run 10 AM Peak	2416	1651	+
Run 10 Inter Peak	2224	1404	+
Run 10 PM Peak	3169	1625	+
Run 14 AM Peak	2451	1674	x
Run 14 Inter Peak	2300	1457	x
Run 14 PM Peak	3394	1658	x
Run 13 AM Peak	2467	1692	o
Run 13 Inter Peak	2305	1490	o
Run 13 PM Peak	3381	1664	o
Run 8 AM Peak	2134	1599	□
Run 8 Inter Peak	2141	1352	□
Run 8 PM Peak	3120	1599	□
Run 21 AM Peak	1975	1551	△
Run 21 Inter Peak	2009	1310	△
Run 21 PM Peak	2987	1569	△

Figure 3.26b Motorway diverging diagram



KEY

Existing Layout

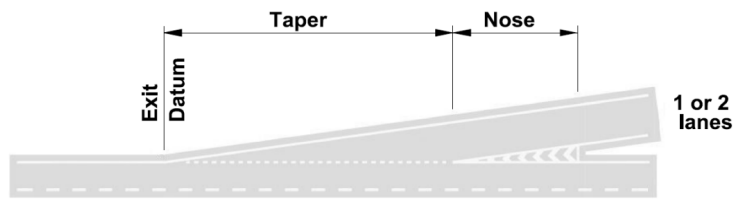
	Scenario	Layout Type	Lane Configuration			Is Existing Layout Adequate?
			Connector Road	Upstream Mainline	Downstream Mainline	
	Existing Layout	C	1	3	2	
Key	Layout Required					
✗	Run 14 AM Peak	D	2	3	2	✗
✗	Run 14 Inter Peak	D	2	3	2	✗
✗	Run 14 PM Peak	D	2	3	2	✗
○	Run 13 AM Peak	D	2	3	2	✗
○	Run 13 Inter Peak	D	2	3	2	✗
○	Run 13 PM Peak	D	2	3	2	✗
□	Run 8 AM Peak	D	2	3	2	✗
□	Run 8 Inter Peak	B	2	2	2	✗
□	Run 8 PM Peak	D	2	3	2	✗
△	Run 21 AM Peak	B	2	2	2	✗
△	Run 21 Inter Peak	A	1	2	2	✓
△	Run 21 PM Peak	D	2	3	2	✗

KEY

- ✓ Adequate
✗ Requires further investigation

Existing Layout CD122 Layout Diagram

Figure 3.30a Layout A option 1 - taper diverge

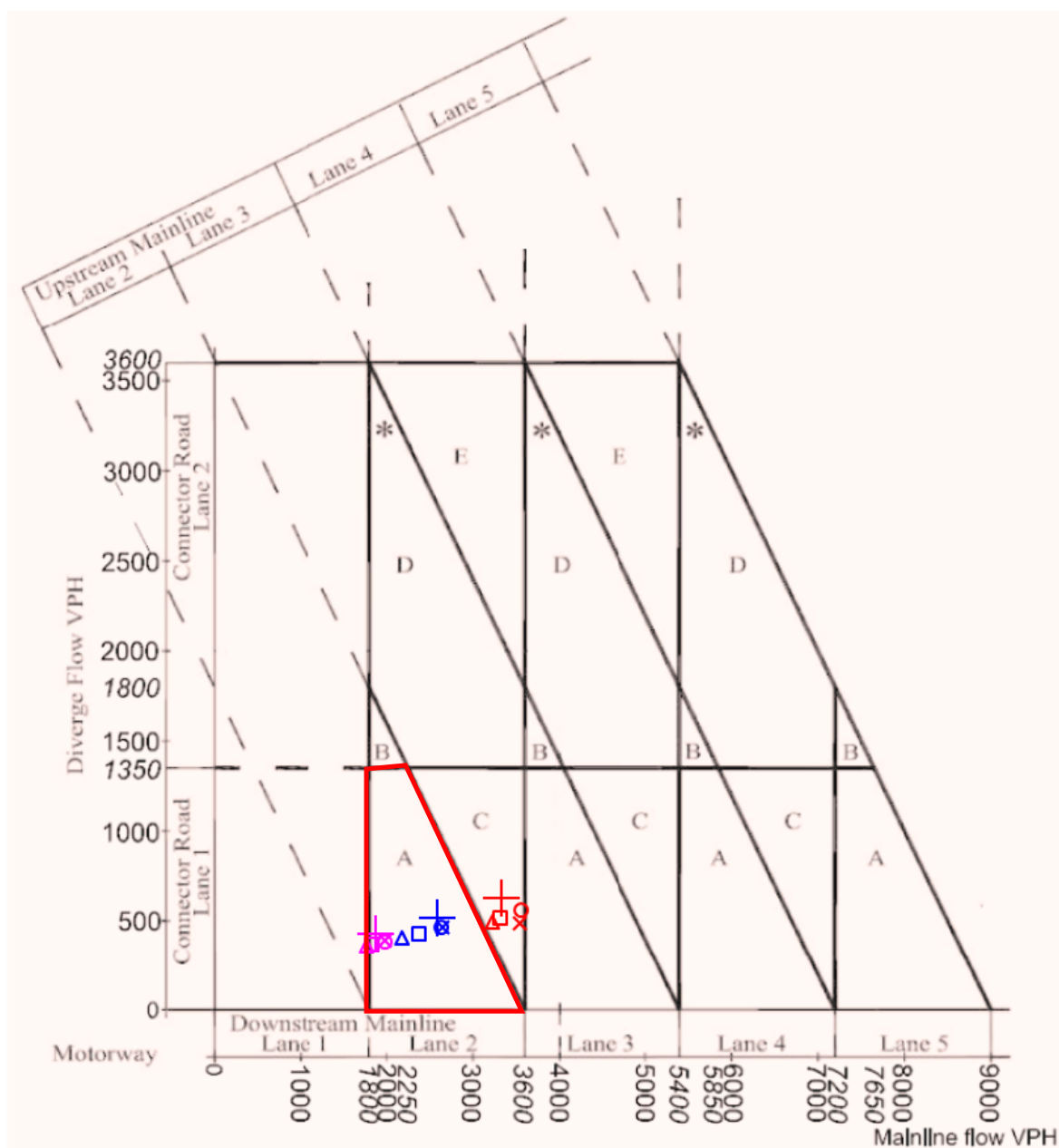


Existing Layout Satellite Image



NGTM Model Fows			
Scenario	Mainline Flow VPH	Diverge Flow VPH	Key
Run 10 AM Peak	3360	624	+
Run 10 Inter Peak	1891	429	+
Run 10 PM Peak	2600	512	+
Run 14 AM Peak	3564	486	x
Run 14 Inter Peak	1995	388	x
Run 14 PM Peak	2669	465	x
Run 13 AM Peak	3586	556	o
Run 13 Inter Peak	1994	385	o
Run 13 PM Peak	2652	463	o
Run 8 AM Peak	3343	512	□
Run 8 Inter Peak	1849	369	□
Run 8 PM Peak	2402	429	□
Run 21 AM Peak	3249	496	△
Run 21 Inter Peak	1783	357	△
Run 21 PM Peak	2200	406	△

Figure 3.26b Motorway diverging diagram



KEY

Existing Layout

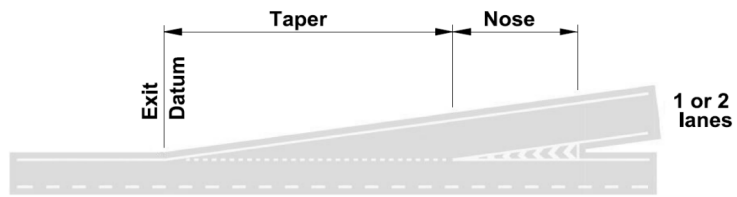
	Scenario	Layout Type	Lane Configuration			Is Existing Layout Adequate?
			Connector Road	Upstream Mainline	Downstream Mainline	
	Existing Layout	A	1	2	2	
Key	Layout Required					
✖	Run 14 AM Peak	C	1	3	2	✖
✖	Run 14 Inter Peak	A	1	2	2	✓
✖	Run 14 PM Peak	A	1	2	2	✓
○	Run 13 AM Peak	C	1	3	2	✖
○	Run 13 Inter Peak	A	1	2	2	✓
○	Run 13 PM Peak	A	1	2	2	✓
□	Run 8 AM Peak	C	1	3	2	✖
□	Run 8 Inter Peak	A	1	2	2	✓
□	Run 8 PM Peak	A	1	2	2	✓
△	Run 21 AM Peak	C	1	3	2	✖
△	Run 21 Inter Peak	A	1	2	1	✓
△	Run 21 PM Peak	A	1	2	2	✓

KEY

- ✓ Adequate
✖ Requires further investigation

Existing Layout CD122 Layout Diagram

Figure 3.30a Layout A option 1 - taper diverge



Existing Layout Satellite Image



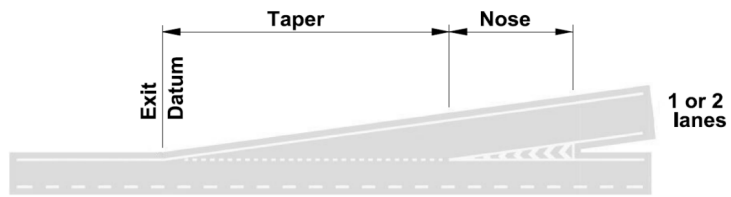
	Scenario	Layout Type	Lane Configuration			Is Existing Layout Adequate?
			Connector Road	Upstream Mainline	Downstream Mainline	
	Existing Layout	A	1	3	3	
Key	Layout Required					
x	Run 14 AM Peak	C	1	3	2	✓
x	Run 14 Inter Peak	C	1	3	2	✓
x	Run 14 PM Peak	A	1	3	3	✓
o	Run 13 AM Peak	A	1	3	3	✓
o	Run 13 Inter Peak	C	1	3	2	✓
o	Run 13 PM Peak	A	1	3	3	✓
□	Run 8 AM Peak	C	1	3	2	✓
□	Run 8 Inter Peak	A	1	2	2	✓
□	Run 8 PM Peak	A	1	3	3	✓
△	Run 21 AM Peak	C	1	3	2	✓
△	Run 21 Inter Peak	A	1	2	2	✓
△	Run 21 PM Peak	A	1	3	3	✓

KEY

- ✓ Adequate
 x Requires further investigation

Existing Layout CD122 Layout Diagram

Figure 3.30a Layout A option 1 - taper diverge

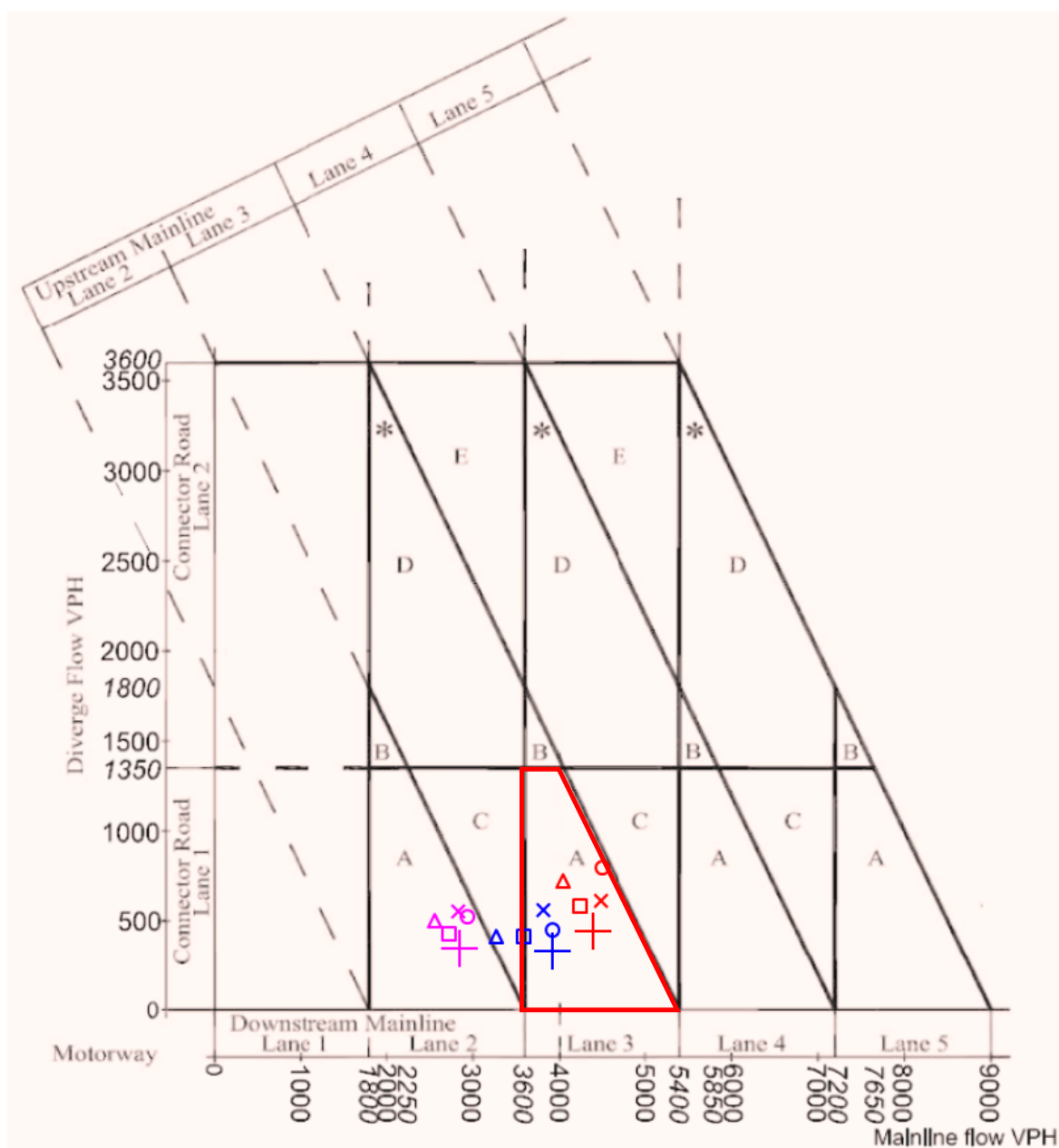


Existing Layout Satellite Image



NGTM Model Fows			
Scenario	Mainline Flow VPH	Diverge Flow VPH	Key
Run 10 AM Peak	4425	440	+
Run 10 Inter Peak	2871	347	+
Run 10 PM Peak	3953	329	+
Run 14 AM Peak	4516	608	x
Run 14 Inter Peak	2855	552	x
Run 14 PM Peak	3840	561	x
Run 13 AM Peak	4522	798	o
Run 13 Inter Peak	2951	526	o
Run 13 PM Peak	3952	451	o
Run 8 AM Peak	4266	580	□
Run 8 Inter Peak	2740	430	□
Run 8 PM Peak	3605	415	□
Run 21 AM Peak	4073	724	△
Run 21 Inter Peak	2572	497	△
Run 21 PM Peak	3288	413	△

Figure 3.26b Motorway diverging diagram



KEY

Existing Layout

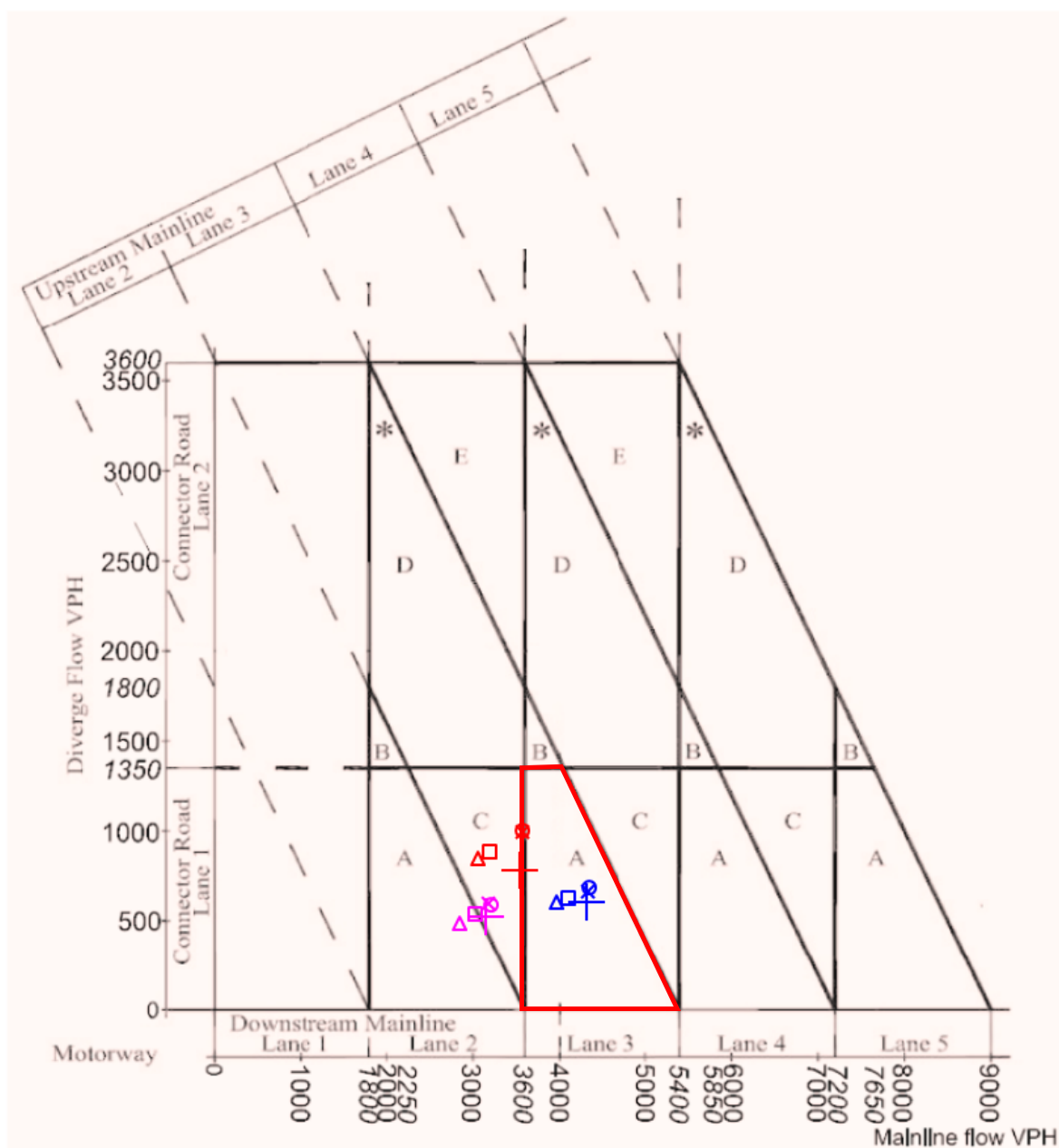
	Scenario	Layout Type	Lane Configuration			Is Existing Layout Adequate?
			Connector Road	Upstream Mainline	Downstream Mainline	
	Existing Layout	A	1	3	3	
Key	Layout Required					
x	Run 14 AM Peak	A	1	3	3	✓
x	Run 14 Inter Peak	A	1	2	2	✓
x	Run 14 PM Peak	A	1	3	3	✓
o	Run 13 AM Peak	A	1	3	3	✓
o	Run 13 Inter Peak	A	1	2	2	✓
o	Run 13 PM Peak	A	1	3	3	✓
□	Run 8 AM Peak	A	1	3	3	✓
□	Run 8 Inter Peak	A	1	2	2	✓
□	Run 8 PM Peak	A	1	3	3	✓
△	Run 21 AM Peak	A	1	3	3	✓
△	Run 21 Inter Peak	A	1	2	2	✓
△	Run 21 PM Peak	C	1	3	2	✓

KEY

- ✓ Adequate
 x Requires further investigation

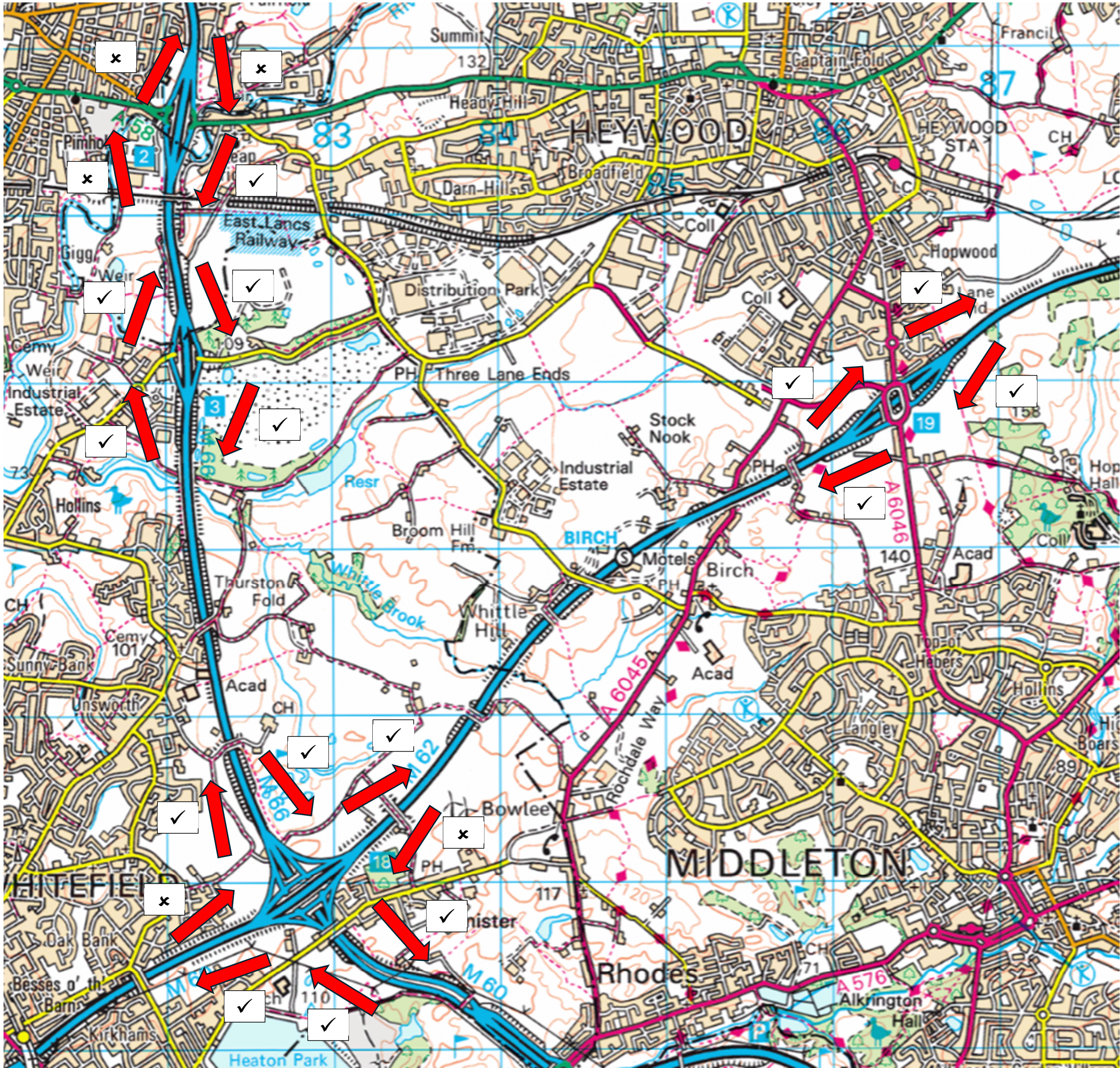
NGTM Model Flows			
Scenario	Mainline Flow VPH	Diverge Flow VPH	Key
Run 10 AM Peak	3566	780	+
Run 10 Inter Peak	3169	526	+
Run 10 PM Peak	4343	600	+
Run 14 AM Peak	3593	995	x
Run 14 Inter Peak	3202	596	x
Run 14 PM Peak	4357	664	x
Run 13 AM Peak	3603	1003	o
Run 13 Inter Peak	3238	591	o
Run 13 PM Peak	4370	685	o
Run 8 AM Peak	3222	883	□
Run 8 Inter Peak	3042	537	□
Run 8 PM Peak	4123	628	□
Run 21 AM Peak	3079	849	△
Run 21 Inter Peak	2866	483	△
Run 21 PM Peak	3985	602	△

Figure 3.26b Motorway diverging diagram



KEY

Existing Layout



No.	Location	Is Existing Layout Adequate ?
1	M62 J18 EB Merge	✓
2	M62 J18 NB Merge	✓
3	M62 J18 SB Merge	✓
4	M62 J18 WB Merge	✓
5	M62 J19 EB Merge	✓
6	M62 J19 WB Merge	✓
7	M66 J2 NB Merge	x
8	M66 J2 SB Merge	✓
9	M66 J3 NB Merge	✓
10	M66 J3 SB Merge	✓
11	M62 J18 EB Diverge	x
12	M62 J18 NB Diverge	✓
13	M62 J18 SB Diverge	✓
14	M62 J18 WB Diverge	x
15	M62 J19 EB Diverge	✓
16	M62 J19 WB Diverge	✓
17	M66 J2 NB Diverge	x
18	M66 J2 SB Diverge	x
19	M66 J3 NB Diverge	✓
20	M66 J3 SB Diverge	✓

MERGE / DIVERGE
OUTPUTS

Merge Diverge Assessment Outputs

		Run 14: 2039 Do Something 3 (JPA1.1+ JPA1.2) - With M62 Access Solution - Policy Off			Run 13: 2039 Do Something 3 (JPA1.1+ JPA1.2) - Without M62 Access Solution - Policy Off			Run 8: 2032 Do Something 3 (JPA1.1 + JPA1.2, partial build out to 2032) - Without M62 Access Solution - Policy Off			Run 21: 2039 Do Something 3 (JPA1.1+ JPA1.2) - Without M62 Access Solution - Policy On		
Connector Road		AM	Inter Peak	PM	AM	Inter Peak	PM	AM	Inter Peak	PM	AM	Inter Peak	PM
1	M62 J18 EB Merge												
2	M62 J18 NB Merge												
3	M62 J18 SB Merge												
4	M62 J18 WB Merge												
5	M62 J19 EB Merge												
6	M62 J19 WB Merge												
7	M66 J2 NB Merge			x			x						
8	M66 J2 SB Merge												
9	M66 J3 NB Merge												
10	M66 J3 SB Merge												
11	M62 J18 EB Diverge			x			x			x			
12	M62 J18 NB Diverge												
13	M62 J18 SB Diverge												
14	M62 J18 WB Diverge	x		x	x			x			x		
15	M62 J19 EB Diverge												
16	M62 J19 WB Diverge												
17	M66 J2 NB Diverge	x	x	x	x	x	x	x	x	x	x		x
18	M66 J2 SB Diverge	x			x			x			x		
19	M66 J3 NB Diverge												
20	M66 J3 SB Diverge												

KEY

- = Existing layout provides sufficient capacity for scenario
- x = Volumes suggest a higher level provision than existing
- x = DCO scheme for M62 J18 provides sufficient capacity