

Annex F

Cost-Effectiveness Analysis

Factor E H26

Flyover	H26 IEC	Effectiveness Analysis													
		With 3 m Barrier				With 5 m Barrier + Cantilever				Semi-enclosure					
Receiver	Floor	Noise Reduction	Dwellings	Floors	Factor R	Noise Reduction	Dwellings	Floors	Factor R	Noise Reduction	Dwellings	Floors	Factor R		
1 City Garden	Low	19.80	6	8	950	23.50	6	8	1128	20.00	6	8	960		
	Mid	0.00	6	8	0	0.90	6	8	43	20.00	6	8	960		
	Top	0.00	6	9	0	0.00	6	9	0	20.00	6	9	1080		
2 City Garden	Low	16.30	4	8	522	21.40	4	8	685	20.00	4	8	640		
	Mid	1.70	4	8	54	11.50	4	8	368	20.00	4	8	640		
	Top	0.20	4	9	7	2.00	4	9	72	20.00	4	9	720		
3 Provident Centre	Low	17.70	14	8	1982	22.50	14	8	2520	20.00	14	8	2240		
	Mid	0.80	14	8	90	9.10	14	8	1019	20.00	14	8	2240		
	Top	0.10	14	8	11	1.00	14	8	112	20.00	14	8	2240		
4 North Point Estate	Low	17.40	16	4	1114	22.50	16	4	1440	20.00	16	4	1280		
	Mid	10.30	16	5	824	17.80	16	5	1424	20.00	16	5	1600		
	Top	1.00	16	5	80	9.00	16	5	720	20.00	16	5	1600		
5 North Point Estate	Low	18.80	16	4	1203	23.10	16	4	1478	20.00	16	4	1280		
	Mid	8.70	16	5	696	16.70	16	5	1336	20.00	16	5	1600		
	Top	0.20	16	5	16	3.60	16	5	288	20.00	16	5	1600		
				Factor E	7550					Factor E	12634				
				Factor E	20680					Factor E	20680				

Factor E H34

Flyover	H34 IEC	Effectiveness Analysis													
		With 3 m Barrier				With 5 m Barrier + Cantilever				Semi-enclosure					
Receiver	Floor	Noise Reduction	Dwellings	Floors	Factor R	Noise Reduction	Dwellings	Floors	Factor R	Noise Reduction	Dwellings	Floors	Factor R		
1 Heng Fa Chuen Blk. 15	Low	13.20	6	4	317	18.40	6	4	442	20.00	6	4	480		
	Mid	6.80	6	4	163	14.80	6	4	355	20.00	6	4	480		
	Top	0.70	6	5	21	8.90	6	5	267	20.00	6	5	600		
2 Heng Fa Chuen Blk. 18	Low	11.50	4	4	184	13.50	4	4	216	20.00	4	4	320		
	Mid	3.90	4	4	62	11.10	4	4	178	20.00	4	4	320		
	Top	0.10	4	5	2	4.80	4	5	96	20.00	4	5	400		
3 Heng Fa Chuen Blk. 17	Low	13.50	6	4	324	18.00	6	4	432	20.00	6	4	480		
	Mid	2.90	6	4	70	12.80	6	4	307	20.00	6	4	480		
	Top	0.10	6	5	3	3.90	6	5	117	20.00	6	5	600		
4 Heng Fa Chuen Blk. 16	Low	10.80	4	4	173	14.70	4	4	235	20.00	4	4	320		
	Mid	5.80	4	4	93	12.20	4	4	195	20.00	4	4	320		
	Top	0.30	4	5	6	7.50	4	5	150	20.00	4	5	400		
				Factor E	1418					Factor E	2990				

Factor E H41

Flyover		H41 Ap Lei Chau Bridge												
Receiver	Floor	Effectiveness Analysis												
		With 3 m Barrier				With 5 m Barrier + Cantilever				Semi-enclosure				
		Noise Reduction	Dwellings	Floors	Factor R	Noise Reduction	Dwellings	Floors	Factor R	Noise Reduction	Dwellings	Floors	Factor R	
1 Shan Ming Street No.9	Low	5.05	2	3	30	5.20	2	3	31	5.17	2	3	31	
	Mid	4.97	2	3	30	5.15	2	3	31	5.12	2	3	31	
	Top	4.68	2	4	37	4.97	2	4	40	4.97	2	4	40	
2 Shan Ming Street No.43	Low	3.91	4	2	31	3.99	4	2	32	3.98	4	2	32	
	Mid	3.89	4	2	31	3.98	4	2	32	3.97	4	2	32	
	Top	3.66	4	2	29	3.86	4	2	31	3.88	4	2	31	
3 Shan Ming Street No.43	Low	2.13	2	2	9	2.16	2	2	9	2.18	2	2	9	
	Mid	2.08	2	2	8	2.12	2	2	8	2.14	2	2	9	
	Top	1.68	2	2	7	1.75	2	2	7	1.78	2	2	7	
4 Ping Lan Street	Low	1.80	2	2	7	1.83	2	2	7	2.05	2	2	8	
	Mid	1.67	2	2	7	1.70	2	2	7	1.90	2	2	8	
	Top	0.89	2	2	4	0.92	2	2	4	1.03	2	2	4	
5 San Shi Street	Low	1.43	2	2	6	1.45	2	2	6	1.67	2	2	7	
	Mid	1.32	2	2	5	1.35	2	2	5	1.54	2	2	6	
	Top	0.58	2	2	2	0.61	2	2	2	0.69	2	2	3	
6 San Shi Street				Factor E	244				Factor E	252			Factor E	256

Factor E K2

Flyover		K2 Kwai Chung Road							
Receiver	Floor	Effectiveness Factor E				With 5 m Barrier + Cantilever			
		With 3 m Barrier Noise Reduction	Dwellings	Floors	Factor E	Noise Reduction	Dwellings	Floors	Factor E
2 Mei Foo Sun Chuen Phase 5 - Block 2	Low	12.48	10	7	874	17.73	10	7	1241
	Mid	10.69	10	7	748	16.65	10	7	1165
	Top	7.59	10	7	531	14.75	10	7	1033
3 Mei Foo Sun Chuen Phase 7 - Block 16	Low	8.76	6	7	368	14.62	6	7	614
	Mid	0.30	6	7	13	7.38	6	7	310
	Top	2.90	6	7	122	3.20	6	7	134
4 Mei Foo Sun Chuen Phase 7 - Block 12	Low	3.90	2	7	55	11.80	2	7	165
	Mid	0.00	2	7	0	0.10	2	7	1
	Top	5.80	2	7	81	5.80	2	7	81
5 Mei Foo Sun Chuen Phase 7 - Block 12	Low	7.29	2	7	102	11.62	2	7	163
	Mid	0.00	2	7	0	3.21	2	7	45
	Top	3.66	2	7	51	3.66	2	7	51
6 Mei Foo Sun Chuen Phase 7 - Block 9	Low	6.84	16	7	767	9.51	16	7	1065
	Mid	0.19	16	7	21	5.06	16	7	567
	Top	3.17	16	7	355	3.36	16	7	376
7 Mei Foo Sun Chuen Phase 7 - Block 1	Low	-2.02	2	7	-28	-1.79	2	7	-25
	Mid	0.06	2	7	1	2.25	2	7	32
	Top	4.39	2	7	61	4.45	2	7	62
8 Mei Foo Sun Chuen Phase 6 - Block 40	Low	0.78	12	7	65	1.01	12	7	85
	Mid	2.06	12	7	173	3.83	12	7	322
	Top	2.04	12	7	171	5.06	12	7	425
9 Mei Foo Sun Chuen Phase 6	Low	0.70	7	7	35	1.13	7	7	55

Factor E K2

- Block 46	Mid	0.98	7	7	48	3.64	7	7	178
	Top	1.88	7	7	92	4.19	7	7	205
10 Mei Foo Sun Chuen Phase 6	Low	3.47	6	7	146	4.16	6	7	175
- Block 25	Mid	3.00	6	7	126	4.47	6	7	188
	Top	1.66	6	7	70	4.57	6	7	192
11 Mei Foo Sun Chuen Phase 6	Low	3.97	4	7	111	4.70	4	7	131
- Block 9	Mid	3.52	4	7	99	4.83	4	7	135
	Top	2.66	4	7	75	4.82	4	7	135
			Total		5330	Total		9307	

Factor E K4

Flyover		K4 West Kowloon Corridor			
Receiver	Floor	Effectiveness Factor E			
		With 3 m Barrier Noise Reducti	Dwellings	Floors	Factor E
1 Nam Cheong Estate	Low	15.69	48	5	3766
	Mid	13.30	48	5	3192
	Top	9.20	48	5	2208
				Total	9166
<p>Note : Direct Technical Remedies could not be incorporated into the residential buildings along Tung Chow Street opposite Nam Cheong Estate due to insufficient space (FSD)</p>					

Factor E K53

Flyover		K53 Kwun Tong Bypass									
		<i>Effectiveness Factor E</i>									
Receiver	Floor	With 3 m Barrier Noise Reduction	Dwellings	Floors	Factor E	With 5 m Barrier + Cantilever Noise Reduction	Dwellings	Floors	Factor E		
1 Laguna City Blk. 8	Low	9.30	15	9	1255	10.30	15	9	1390		
	Mid	7.60	15	9	1026	10.30	15	9	1390		
	Top	3.70	15	9	499	9.30	15	9	1255		
2 Laguna City Blk. 1	Low	13.20	15	9	1782	16.00	15	9	2160		
	Mid	6.50	15	9	877	13.10	15	9	1768		
	Top	0.70	15	9	94	8.20	15	9	1107		
				Total	5535					Total	9072

Factor E K56

Flyover		K56 Tseung Kwan O Road															
		Effectiveness Factor E															
Receiver	Floor	With 3 m Barrier				With 5 m Barrier + Cantilever				Semi-enclosure							
		Noise Reduction	Dwellings	Floors	Factor E	Noise Reduction	Dwellings	Floors	Factor E	Noise Reduction	Dwellings	Floors	Factor E				
1 Tsui Ping Est. S Blk. F	Low	7.50	6	11	495	7.99	6	11	528	7.97	6	11	526				
	Mid	5.63	6	12	405	7.54	6	12	543	7.89	6	12	568				
	Top	0.66	6	12	48	6.14	6	12	442	7.81	6	12	563				
2 Tsui Ping Est. S Blk. E	Low	10.39	6	11	686	10.68	6	11	705	10.75	6	11	709				
	Mid	1.70	6	12	123	4.51	6	12	324	6.13	6	12	441				
	Top	0.07	6	12	5	2.02	6	12	146	5.84	6	12	421				
3 Tsui Ping Est. S Blk. C & D	Low	1.93	12	11	255	1.99	12	11	263	2.64	12	11	348				
	Mid	0.12	12	12	17	1.54	12	12	222	2.25	12	12	325				
	Top	-0.04	12	12	-6	0.16	12	12	23	2.21	12	12	319				
4 Tsui Ping Est. S Blk. A & B	Low	0.20	12	11	26	0.21	12	11	27	0.50	12	11	66				
	Mid	-0.04	12	12	-5	0.11	12	12	16	0.38	12	12	55				
	Top	-0.07	12	12	-10	-0.06	12	12	-8	0.40	12	12	58				
		Total				2040				Total				3230			
										Total				4399			

Factor E NT25

Flyover		NT25 Sha Tin Road													
Effective Factor E															
Receiver	Floor	With 3 m Barrier				With 5 m Barrier + Cantilever				enclosure					
		Noise Reduction	Dwellings	Floors	Factor E	Noise Reduction	Dwellings	Floors	Factor E	Noise Reduction	Dwellings	Floors	Factor E		
1 City One Shatin Blk. 15	Low	3.74	6	10	224	3.97	6	10	238	4.01	6	10	241		
	Mid	-1.94	6	10	-116	2.54	6	10	152	4.94	6	10	296		
	Top	-2.15	6	10	-129	-1.45	6	10	-87	4.81	6	10	289		
2 City One Shatin Blk. 20	Low	7.77	16	10	1242	8.70	16	10	1391	8.79	16	10	1407		
	Mid	-1.87	16	10	-299	5.13	16	10	821	8.45	16	10	1353		
	Top	-2.58	16	10	-412	-1.00	16	10	-160	7.11	16	10	1138		
3 City One Shatin Blk. 51	Low	3.40	10	10	340	3.64	10	10	364	3.68	10	10	368		
	Mid	-1.15	10	10	-115	2.71	10	10	271	3.82	10	10	382		
	Top	-1.96	10	10	-196	-0.35	10	10	-35	3.65	10	10	365		
4 Belair Gardens (East Facade)	Low	5.07	4	10	203	5.54	4	10	222	5.60	4	10	224		
	Mid	3.08	4	10	123	5.42	4	10	217	5.91	4	10	237		
	Top	-1.75	4	10	-70	4.21	4	10	168	5.91	4	10	237		
5 Belair Gardens (North Facade)	Low	2.09	6	10	125	2.19	6	10	132	2.21	6	10	132		
	Mid	1.93	6	10	116	2.69	6	10	161	2.82	6	10	169		
	Top	-0.82	6	10	-49	2.79	6	10	167	3.38	6	10	203		
				Total	986					Total	4024				
											Total	7040			

Factor E NT62

Flyover		NT62 Tsuen Wan Road														
Receiver	Floor	Effectiveness Factor E														
		With 3 m Barrier				With 5 m Barrier + Cantilever				Semi-enclosure						
		Noise Reduction	Dwellings	Floors	Factor E	Noise Reduction	Dwellings	Floors	Factor E	Noise Reduction	Dwellings	Floors	Factor E			
1 Clague Garden Est.	Low	0.42	12	12	60	0.44	12	12	63	0.45	12	12	64			
	Mid	0.09	12	12	13	0.40	12	12	58	0.45	12	12	64			
	Top	0.00	12	12	0	0.21	12	12	30	0.48	12	12	69			
2 Clague Garden Est.	Low	4.42	4	12	212	4.88	4	12	234	4.94	4	12	237			
	Mid	0.20	4	12	10	3.55	4	12	170	4.94	4	12	237			
	Top	0.00	4	12	0	0.60	4	12	29	5.01	4	12	240			
3 Clague Garden Est.	Low	9.11	10	12	1093	10.07	10	12	1209	10.08	10	12	1210			
	Mid	2.31	10	12	277	8.64	10	12	1037	10.25	10	12	1229			
	Top	0.09	10	12	11	3.95	10	12	474	10.25	10	12	1229			
4 Clague Garden Est.	Low	12.74	4	12	611	14.39	4	12	691	14.01	4	12	673			
	Mid	0.00	4	12	0	0.39	4	12	19	14.72	4	12	707			
	Top	0.00	4	12	0	0.00	4	12	0	14.58	4	12	700			
		Total				2287	Total				4015	Total				6660

Factor E NT69

Flyover		NT69 Kwai Chung Road											
Receiver	Floor	Effectiveness Factor E											
		With 3 m Barrier				With 5 m Barrier + Cantilever				Semi-enclosure			
		Noise Reduction	Dwellings	Floors	Factor E	Noise Reduction	Dwellings	Floors	Factor E	Noise Reduction	Dwellings	Floors	Factor E
1 Kwai On House	Low	2.70	18	8	388	2.98	18	8	429	4.49	18	8	648
	Mid	1.40	18	8	202	2.97	18	8	427	4.61	18	8	664
	Top	-0.32	18	8	-46	2.44	18	8	351	4.74	18	8	683
2 Kwai Tak House	Low	2.89	16	8	344	2.90	16	8	372	4.30	16	8	550
	Mid	1.65	16	8	212	2.96	16	8	379	4.49	16	8	574
	Top	-0.39	16	8	-50	2.42	16	8	310	4.68	16	8	599
3 Kwai Fong Est Blk. 3	Low	2.61	20	8	418	2.70	20	8	433	4.18	20	8	668
	Mid	2.45	20	8	392	2.98	20	8	477	4.55	20	8	728
	Top	0.00	20	8	-1	2.65	20	8	424	4.68	20	8	749
4 Police Quarter	Low	2.45	6	8	117	2.58	6	8	124	4.06	6	8	195
	Mid	-0.16	6	8	-8	2.78	6	8	133	5.01	6	8	240
	Top	-0.43	6	8	-20	0.18	6	8	8	5.28	6	8	253
5 Kwai Fong Terrace	Low	2.28	12	12	329	2.46	12	12	354	3.65	12	12	526
	Mid	-0.42	12	11	-56	1.26	12	11	167	4.30	12	11	567
	Top	-0.42	12	11	-56	-0.19	12	11	-25	4.42	12	11	584
		Total				Total				Total			
		2166				4362				8227			

Factor E NT71

Flyover		NT71 Tsing Tsuen Road											
		Effectiveness Factor E											
Receiver	Floor	With 3 m Barrier				With 5 m Barrier + Cantilever				Semi-enclosure			
		Noise Reduction	Dwellings	Floors	Factor E	Noise Reduction	Dwellings	Floors	Factor E	Noise Reduction	Dwellings	Floors	Factor E
1 Riviera Gardens - Hoi Kwun Court	Low	14.31	12	13	2232	18.68	12	13	2914	7.10	12	13	1107
	Mid	0.10	12	13	15	3.84	12	13	599	7.05	12	13	1100
	Top	-0.01	12	13	-1	0.09	12	13	14	6.84	12	13	1068
2 Riviera Gardens - Hoi Fung Court	Low	13.11	10	13	1704	15.52	10	13	2018	14.65	10	13	1904
	Mid	0.00	10	13	0	0.09	10	13	12	11.52	10	13	1497
	Top	0.00	10	13	0	0.00	10	13	0	9.42	10	13	1225
3 Riviera Gardens - Hoi Kwai Court	Low	9.50	10	13	1235	13.41	10	13	1743	12.26	10	13	1594
	Mid	0.00	10	13	0	0.26	10	13	34	9.34	10	13	1214
	Top	0.00	10	13	0	0.00	10	13	0	7.54	10	13	980
4 Riviera Gardens - Hoi Yue Court	Low	6.62	5	13	430	7.52	5	13	489	6.58	5	13	428
	Mid	0.37	5	13	24	4.48	5	13	291	5.97	5	13	388
	Top	0.00	5	13	0	0.67	5	13	44	5.17	5	13	336
5 Tsing On THA	Low	0.44	10	1	4	0.44	10	1	4	8.55	10	1	86
6 Cheung On Estate - On Chiu House	Low	1.87	6	11	124	1.97	4	11	87	13.69	6	11	903
	Mid	0.00	6	11	0	0.27	4	11	12	10.32	6	11	681
	Top	0.00	6	11	0	0.00	4	11	0	6.96	6	11	459
7 Cheung On Estate - On Chiu House	Low	7.37	6	11	486	8.15	4	11	359	15.23	6	11	1005
	Mid	0.10	6	11	7	2.12	4	11	93	14.84	6	11	980
	Top	-0.01	6	11	-1	0.09	4	11	4	7.37	6	11	486
8 Cheung On Estate - On Pak House	Low	8.05	6	11	532	8.97	4	11	395	14.94	6	11	986
	Mid	0.29	6	11	19	4.42	4	11	194	14.36	6	11	948
	Top	-0.01	6	11	-1	0.18	4	11	8	8.26	6	11	545
9 Cheung On Estate - On Pak House	Low	8.75	6	11	578	9.94	4	11	438	11.15	6	11	736
	Mid	0.28	6	11	18	4.98	4	11	219	11.61	6	11	766
	Top	-0.02	6	11	-1	0.26	4	11	12	7.64	6	11	504
10 Cheung On Estate - On Pak House	Low	8.24	6	11	544	9.20	4	11	405	9.16	6	11	605
	Mid	0.08	6	11	5	4.12	4	11	181	10.59	6	11	699
	Top	-0.02	6	11	-1	0.08	4	11	4	7.32	6	11	483
11 Cheung On Estate - On Pak House	Low	3.55	6	11	234	3.73	4	11	164	3.68	6	11	243
	Mid	0.56	6	11	37	4.07	4	11	179	4.53	6	11	299

Factor E NT71

	Top	-0.09	6	11	-6	0.45	4	11	20	3.28	6	11	216
12 Cheung On Estate - On Mei House	Low	3.82	6	11	252	4.04	4	11	178	3.91	6	11	258
	Mid	2.29	6	11	151	4.29	4	11	189	4.44	6	11	293
	Top	-0.04	6	11	-3	2.66	4	11	117	3.17	6	11	209
13 Cheung On Estate - On Mei House	Low	2.34	6	11	154	2.44	4	11	107	2.24	6	11	148
	Mid	2.48	6	11	164	2.93	4	11	129	2.77	6	11	183
	Top	0.97	6	11	64	3.36	4	11	148	1.42	6	11	94
				Total	9001			Total	11804			Total	25658

Cost Effectiveness

Summary of Effectiveness Analysis						
Flyover	Direct Technical Remedies	Total Noise Reduction Factor R (No. of dwelling x dB(A) Noise reduction) (ie Effectiveness Factor E)	Length required (m)	Cost per unit length (HK\$)	Cost Implementation (HK\$) in million	Cost Effective Factor C (x10⁻⁴)
H26 (IEC - Oil St. to Tin Chiu St.)	3 m barrier	7550	1500	173479	260	29.0
	5 m barrier + Cantilever	12634	1500	187075	281	45.0
	semi-enclosure	20680	1500	224188	336	61.5
H34 (IEC - Heng Fa Chuen)	3 m barrier	1418	400	173479	69	20.4
	5 m barrier + Cantilever	2990	400	187075	75	40.0
	semi-enclosure	5200	400	224188	90	58.0
H41 (Ap Lei Chau Bridge)	3 m barrier	244	175	173479	30	8.0
	5 m barrier + Cantilever	252	175	187075	33	7.7
	semi-enclosure	256	175	224188	39	6.5
K2 (Kwai Chung Road)	3 m barrier	5330	650	173479	113	47.3
	5 m barrier + Cantilever	9307	650	187075	122	78.5
K4 (West Kowloon Corridor)	3 m barrier	9166	750	173479	130	70.4
K53 (Kwun Tong Bypass)	3 m barrier	5535	700	173479	121	45.6
	5 m barrier + Cantilever	9072	700	187075	131	69.3
K56 (Tseng Kwan O Road)	3 m barrier	2040	360	173479	62	32.7
	5 m barrier + Cantilever	3230	360	187075	67	48.0
	semi-enclosure	4399	360	224188	81	54.5
NT25 (Sha Tin Road)	3 m barrier	986	1000	173479	173	5.7
	5 m barrier + Cantilever	4024	1000	187075	187	21.5
	enclosure	7040	500	224188	112	62.8
NT62 (Tsuen Wan Road)	3 m barrier	2287	425	173479	74	31.0
	5 m barrier + Cantilever	4015	425	187075	80	50.5
	semi-enclosure	6660	425	224188	95	69.9
NT69 (Kwai Chung Road)	3 m barrier	2166	1000	173479	173	12.5
	5 m barrier + Cantilever	4362	1000	187075	187	23.3
	semi-enclosure	8227	1000	224188	224	36.7
NT71 (Tsing Tsuen Road)	3 m barrier	9001	1000	173479	173	51.9
	5 m barrier + Cantilever	11804	1000	187075	187	63.1
	semi-enclosure	25658	1000	224188	224	114.4