

APPENDIX A

INFORMATION RELATED TO STATUS QUO

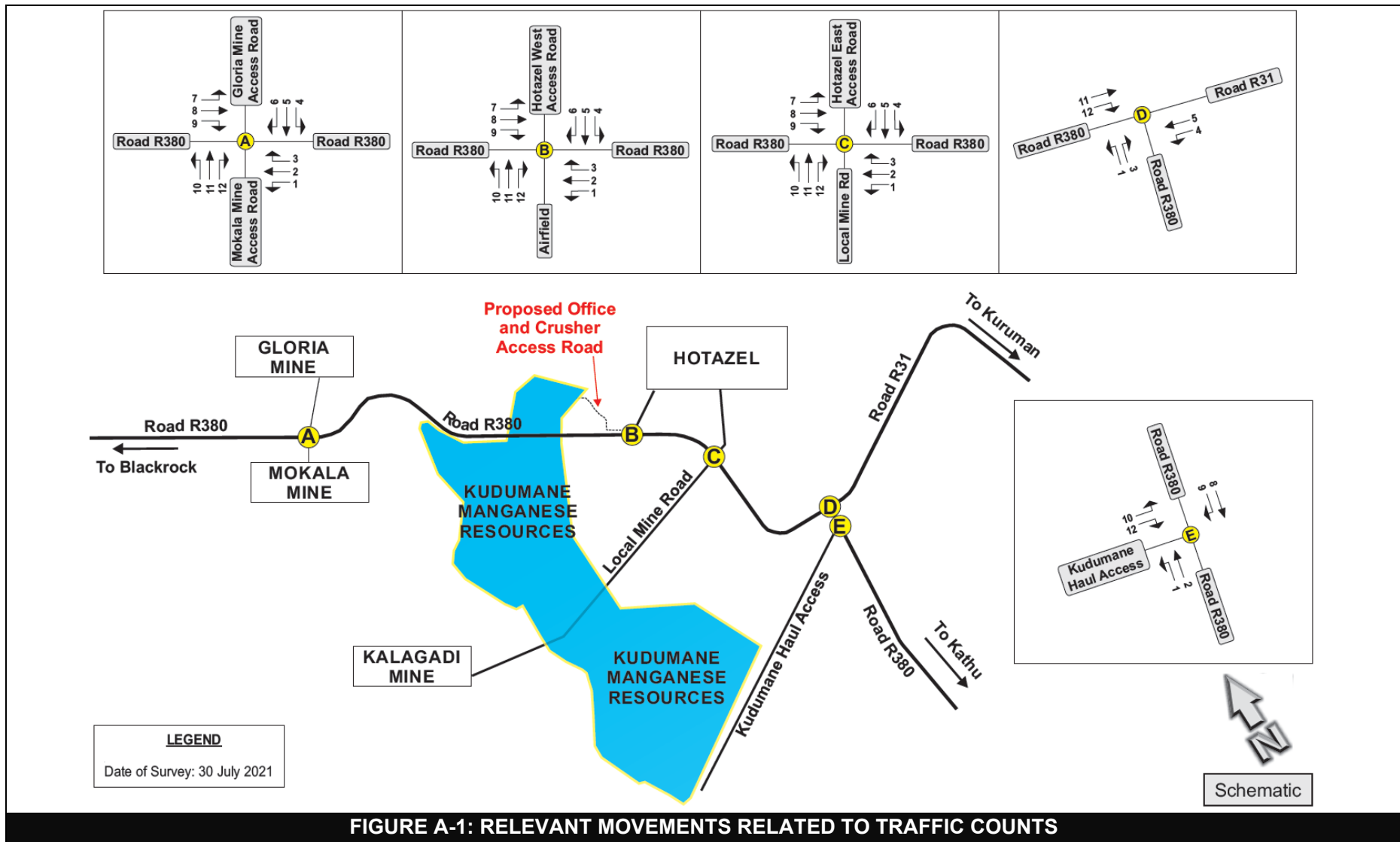


TABLE A-1: HOURLY TRAFFIC COUNTS FOR ALL VEHICLES SIMULTANEOUSLY AT THE INTERSECTION OF ROAD R380, GLORIA MINE ACCESS ROAD AND MOKALA MINE ACCESS ROAD (POINT A)(30 JULY 2021)

TIME INTERVALS	MOVEMENTS												TOTAL
	1	2	3	4	5	6	7	8	9	10	11	12	
06:00-07:00	0	198	62	3	0	11	20	77	0	0	0	0	371
06:15-07:15	0	182	26	3	0	11	14	69	0	0	0	0	305
06:30-07:30	0	148	13	3	0	10	16	60	0	0	0	0	250
06:45-07:45	0	109	4	4	0	8	16	58	0	0	0	0	199
07:00-08:00	0	89	4	4	0	7	15	53	0	0	0	0	172
07:15-08:15	0	69	3	5	0	7	22	52	0	0	0	0	158
07:30-08:30	0	54	2	3	0	6	19	51	0	0	0	0	135
07:45-08:45	0	46	2	5	0	5	16	45	0	0	0	0	119
08:00-09:00	0	48	2	5	0	9	12	46	0	0	0	0	122
08:15-09:15	0	54	3	5	0	8	7	44	0	0	0	0	121
08:30-09:30	0	57	5	7	0	11	6	47	0	0	0	0	133
08:45-09:45	0	52	4	5	0	12	7	54	0	0	0	0	134
09:00-10:00	0	53	4	4	0	14	8	54	0	0	0	0	137
09:15-10:15	0	48	2	3	0	13	9	62	0	0	0	0	137
09:30-10:30	0	49	1	3	0	9	13	64	0	0	0	0	139
09:45-10:45	0	48	3	3	0	8	14	65	0	0	0	0	141
10:00-11:00	0	47	8	5	0	6	14	71	0	0	0	0	151
10:15-11:15	0	42	11	6	0	8	14	72	0	0	0	0	153
10:30-11:30	0	41	11	6	0	11	12	72	0	0	0	0	153
10:45-11:45	0	56	10	8	0	13	12	73	0	0	0	0	172
11:00-12:00	0	67	6	9	0	13	14	73	0	0	0	0	182
11:15-12:15	0	93	4	9	0	11	13	71	0	0	0	0	201
11:30-12:30	0	95	3	11	0	10	10	88	0	0	0	0	217
11:45-12:45	0	86	2	9	0	9	8	89	0	0	0	0	203
12:00-13:00	0	81	1	6	0	6	5	99	0	0	0	0	198
12:15-13:15	0	63	1	6	0	8	6	123	0	0	0	0	207
12:30-13:30	0	62	2	11	0	7	13	179	0	0	0	0	274
12:45-13:45	0	65	4	20	0	7	17	262	0	0	0	0	375
13:00-14:00	0	60	5	23	0	8	17	288	0	0	0	0	401
13:15-14:15	0	59	4	23	0	6	14	283	0	0	0	0	389
13:30-14:30	0	59	5	18	0	6	8	223	0	0	0	0	319
13:45-14:45	0	50	4	9	0	7	3	145	0	0	0	0	218
14:00-15:00	0	42	6	10	0	7	5	112	0	0	0	0	182
14:15-15:15	0	44	7	16	0	9	4	91	0	0	0	0	171
14:30-15:30	0	43	7	16	0	12	3	72	0	0	0	0	153
14:45-15:45	0	43	7	18	0	9	5	81	0	0	0	0	163
15:00-16:00	0	57	5	17	0	13	4	98	0	0	0	0	194
15:15-16:15	0	53	4	20	0	13	4	105	0	0	0	0	199
15:30-16:30	0	52	3	19	0	11	3	103	0	0	0	0	191
15:45-16:45	0	63	4	16	0	14	3	77	0	0	0	0	177
16:00-17:00	0	57	9	14	0	9	4	51	0	0	0	0	144
16:15-17:15	0	60	9	4	0	6	5	36	0	0	0	0	120
16:30-17:30	0	64	11	5	0	4	6	41	0	0	0	0	131
16:45-17:45	0	78	12	5	0	5	4	47	0	0	0	0	151
17:00-18:00	0	111	13	4	0	7	6	44	0	0	0	0	185

TABLE A-2: HOURLY TRAFFIC COUNTS FOR ALL VEHICLES SIMULTANEOUSLY AT THE INTERSECTION OF ROAD R380, AIRFIELD ACCESS AND HOTAZEL WEST ACCESS ROAD (POINT B)(30 JULY 2021)

TIME INTERVALS	MOVEMENTS												TOTAL
	1	2	3	4	5	6	7	8	9	10	11	12	
06:00-07:00	0	189	37	86	0	75	20	64	0	0	0	0	471
06:15-07:15	0	127	58	72	0	85	26	61	0	0	0	0	429
06:30-07:30	0	98	68	60	0	69	28	53	0	0	0	0	376
06:45-07:45	0	63	73	51	0	56	30	42	0	0	0	0	315
07:00-08:00	0	59	63	53	0	45	26	36	0	0	0	0	282
07:15-08:15	0	55	49	48	0	25	24	35	0	0	0	0	236
07:30-08:30	0	42	42	44	0	18	22	40	0	0	0	0	208
07:45-08:45	0	43	33	33	0	12	20	43	0	0	0	0	184
08:00-09:00	0	44	33	20	0	13	23	43	0	0	0	0	176
08:15-09:15	0	52	29	12	0	14	23	39	0	0	0	0	169
08:30-09:30	0	55	25	2	0	17	26	42	0	0	0	0	167
08:45-09:45	0	49	35	2	0	18	26	47	0	0	0	0	177
09:00-10:00	0	46	34	2	0	17	24	50	0	0	0	0	173
09:15-10:15	0	40	39	2	0	18	25	59	0	1	0	0	184
09:30-10:30	0	40	39	2	0	17	22	65	0	1	0	0	186
09:45-10:45	0	35	32	10	0	17	25	61	0	1	0	0	181
10:00-11:00	0	43	30	21	0	18	29	59	0	1	0	0	201
10:15-11:15	0	41	29	27	0	17	31	53	0	0	0	0	198
10:30-11:30	0	38	34	33	0	22	32	53	0	0	0	0	212
10:45-11:45	0	46	40	38	0	26	28	53	0	0	0	0	231
11:00-12:00	0	47	41	38	0	33	25	61	0	0	0	0	245
11:15-12:15	0	73	40	45	0	33	25	63	0	0	0	0	279
11:30-12:30	0	81	41	52	0	31	29	71	0	0	0	0	305
11:45-12:45	0	70	39	60	0	30	26	78	0	0	0	0	303
12:00-13:00	0	68	36	54	0	26	27	85	0	0	0	0	296
12:15-13:15	0	46	41	51	0	25	34	100	0	0	0	0	297
12:30-13:30	0	42	41	53	0	24	50	142	0	0	0	0	352
12:45-13:45	0	61	31	52	0	20	75	205	0	1	0	0	445
13:00-14:00	0	59	32	62	0	18	78	226	0	1	0	0	476
13:15-14:15	0	60	24	70	0	17	76	224	0	1	0	0	472
13:30-14:30	0	62	22	73	0	16	60	180	0	1	0	0	414
13:45-14:45	0	49	29	69	0	16	36	125	0	0	0	0	324
14:00-15:00	0	39	35	66	0	19	39	94	0	0	0	0	292
14:15-15:15	0	40	36	58	0	23	33	88	0	0	0	0	278
14:30-15:30	0	41	37	45	0	23	26	78	0	0	0	0	250
14:45-15:45	0	36	44	32	0	20	26	82	0	0	0	0	240
15:00-16:00	0	50	39	35	0	17	22	97	0	0	0	0	260
15:15-16:15	0	48	40	34	0	13	23	93	0	0	0	0	251
15:30-16:30	0	47	47	44	0	10	24	93	0	0	0	0	265
15:45-16:45	0	62	48	46	0	21	24	69	0	0	0	0	270
16:00-17:00	0	62	47	41	0	21	21	51	0	0	0	0	243
16:15-17:15	0	61	49	39	0	23	15	44	0	0	0	0	231
16:30-17:30	0	67	54	30	0	28	18	40	1	0	0	0	238
16:45-17:45	0	80	48	33	0	24	20	38	1	0	0	0	244
17:00-18:00	0	108	55	28	0	23	18	33	1	0	0	0	266

TABLE A-3: HOURLY TRAFFIC COUNTS FOR ALL VEHICLES SIMULTANEOUSLY AT THE INTERSECTION OF ROAD R380, LOCAL MINE ROAD AND HOTAZEL WEST ACCESS ROAD (POINT C)(30 JULY 2021)

TIME INTERVALS	MOVEMENTS												TOTAL
	1	2	3	4	5	6	7	8	9	10	11	12	
06:00-07:00	84	215	34	16	5	1	1	139	10	10	6	36	557
06:15-07:15	81	170	38	17	5	1	3	110	20	14	6	33	498
06:30-07:30	74	147	41	21	7	2	4	87	22	17	6	33	461
06:45-07:45	73	114	30	19	7	6	4	68	21	16	9	36	403
07:00-08:00	50	104	30	17	5	6	4	64	21	12	10	31	354
07:15-08:15	30	88	22	21	8	6	3	66	14	10	9	25	302
07:30-08:30	24	71	13	15	5	5	4	68	12	8	8	19	252
07:45-08:45	21	69	12	24	4	2	3	63	10	5	4	13	230
08:00-09:00	22	71	9	25	5	1	3	54	6	5	3	10	214
08:15-09:15	23	74	10	23	2	2	3	47	6	5	4	11	210
08:30-09:30	21	73	15	26	4	3	2	40	7	4	4	12	211
08:45-09:45	18	77	11	22	4	2	6	40	8	5	6	12	211
09:00-10:00	10	70	15	23	4	2	7	42	8	8	8	13	210
09:15-10:15	11	71	16	26	6	2	7	44	10	6	6	13	218
09:30-10:30	12	72	13	34	7	1	7	47	13	6	9	12	233
09:45-10:45	10	59	16	38	8	2	4	55	12	6	8	12	230
10:00-11:00	15	63	17	42	7	2	5	62	13	8	8	18	260
10:15-11:15	19	59	14	40	4	2	4	63	13	9	8	21	256
10:30-11:30	18	58	11	35	5	3	3	74	9	11	7	26	260
10:45-11:45	17	67	10	34	5	2	3	77	11	17	7	28	278
11:00-12:00	14	74	12	29	5	2	1	84	14	12	6	26	279
11:15-12:15	11	97	14	35	5	1	1	97	10	15	8	30	324
11:30-12:30	10	107	15	33	3	1	1	110	12	14	6	30	342
11:45-12:45	12	100	18	34	6	1	1	126	11	8	6	30	353
12:00-13:00	11	87	13	37	7	3	1	131	7	14	5	32	348
12:15-13:15	11	74	12	37	9	4	2	141	8	9	8	34	349
12:30-13:30	14	71	15	42	10	3	4	173	9	9	12	37	399
12:45-13:45	10	79	13	41	9	3	7	227	9	10	15	42	465
13:00-14:00	12	85	11	56	10	1	8	255	11	5	19	44	517
13:15-14:15	8	78	12	65	10	0	9	262	11	6	17	42	520
13:30-14:30	11	77	14	70	9	0	8	234	8	7	16	35	489
13:45-14:45	20	72	15	76	7	0	6	182	8	6	19	28	439
14:00-15:00	26	64	16	69	6	0	7	146	9	10	18	27	398
14:15-15:15	34	61	19	56	7	0	9	130	7	15	20	36	394
14:30-15:30	30	61	17	48	6	0	11	107	5	17	22	56	380
14:45-15:45	24	61	18	40	8	0	13	98	3	19	17	65	366
15:00-16:00	17	68	17	30	9	4	12	119	1	17	17	66	377
15:15-16:15	11	70	15	38	6	6	13	116	1	12	16	52	356
15:30-16:30	11	78	12	47	6	6	12	127	1	10	13	34	357
15:45-16:45	14	93	10	48	4	7	8	109	1	10	15	31	350
16:00-17:00	13	98	11	48	2	3	10	84	1	8	16	34	328
16:15-17:15	11	98	13	41	2	1	5	77	1	11	14	35	309
16:30-17:30	12	108	17	30	3	3	5	61	4	10	13	32	298
16:45-17:45	11	118	19	31	5	2	7	58	6	8	11	30	306
17:00-18:00	14	151	34	31	6	2	5	51	6	10	10	19	339

TABLE A-4: HOURLY TRAFFIC COUNTS FOR ALL VEHICLES SIMULTANEOUSLY AT THE INTERSECTION OF ROAD R380 AND ROAD R31 (POINT D)(30 JULY 2021)

TIME INTERVALS	MOVEMENTS						TOTAL
	1	3	4	5	11	12	
06:00-07:00	70	14	322	265	150	38	859
06:15-07:15	60	12	299	235	133	26	765
06:30-07:30	65	28	283	206	112	26	720
06:45-07:45	60	42	217	171	93	25	608
07:00-08:00	55	50	161	139	77	28	510
07:15-08:15	46	42	137	112	67	30	434
07:30-08:30	37	28	110	88	66	27	356
07:45-08:45	28	16	94	82	72	30	322
08:00-09:00	26	10	93	79	71	25	304
08:15-09:15	20	9	71	84	70	16	270
08:30-09:30	21	7	82	90	66	14	280
08:45-09:45	21	8	65	93	62	9	258
09:00-10:00	17	12	86	90	63	13	281
09:15-10:15	18	15	82	93	69	19	296
09:30-10:30	15	17	79	90	78	23	302
09:45-10:45	18	18	83	79	90	25	313
10:00-11:00	21	20	50	81	105	31	308
10:15-11:15	23	17	44	69	104	34	291
10:30-11:30	25	20	30	65	108	34	282
10:45-11:45	26	28	23	68	107	39	291
11:00-12:00	28	23	33	80	107	38	309
11:15-12:15	27	32	36	107	124	40	366
11:30-12:30	28	36	45	111	133	42	395
11:45-12:45	26	31	46	112	146	42	403
12:00-13:00	19	39	44	100	154	41	397
12:15-13:15	20	40	50	85	166	38	399
12:30-13:30	25	47	38	92	200	52	454
12:45-13:45	25	49	43	96	245	63	521
13:00-14:00	29	44	44	98	275	74	564
13:15-14:15	24	47	36	100	289	83	579
13:30-14:30	19	38	51	101	271	72	552
13:45-14:45	16	34	48	109	227	63	497
14:00-15:00	13	43	46	114	194	54	464
14:15-15:15	17	59	41	111	170	47	445
14:30-15:30	19	73	26	109	165	42	434
14:45-15:45	22	74	31	96	157	44	424
15:00-16:00	22	64	29	92	175	35	417
15:15-16:15	24	45	31	84	169	37	390
15:30-16:30	21	34	37	90	157	44	383
15:45-16:45	21	32	26	108	151	32	370
16:00-17:00	18	36	19	113	127	34	347
16:15-17:15	17	26	16	112	126	25	322
16:30-17:30	16	19	31	117	106	16	305
16:45-17:45	15	18	73	126	93	17	342
17:00-18:00	23	15	97	158	79	16	388

**TABLE A-5: HOURLY TRAFFIC COUNTS FOR ALL VEHICLES SIMULTANEOUSLY AT
THE INTERSECTION OF ROAD R380 AND KUDUMANE HAUL ACCESS ROAD
(POINT E)(30 JULY 2021)**

TIME INTERVALS	MOVEMENTS						TOTAL
	1	2	8	9	10	12	
06:00-07:00	0	80	351	9	4	0	444
06:15-07:15	0	65	316	9	7	1	398
06:30-07:30	0	86	307	2	7	1	403
06:45-07:45	0	97	238	4	5	1	345
07:00-08:00	0	99	180	9	6	1	295
07:15-08:15	0	84	157	10	4	0	255
07:30-08:30	0	60	124	13	5	1	203
07:45-08:45	0	39	112	12	5	1	169
08:00-09:00	0	31	110	8	5	1	155
08:15-09:15	0	26	81	6	3	1	117
08:30-09:30	0	26	93	3	2	0	124
08:45-09:45	4	27	72	2	2	0	107
09:00-10:00	4	25	97	2	4	0	132
09:15-10:15	4	27	98	3	6	0	138
09:30-10:30	4	25	99	3	7	0	138
09:45-10:45	0	26	104	4	10	0	144
10:00-11:00	1	32	76	5	9	0	123
10:15-11:15	2	32	72	6	8	0	120
10:30-11:30	2	39	58	6	6	0	111
10:45-11:45	4	46	56	6	8	0	120
11:00-12:00	3	41	64	7	10	0	125
11:15-12:15	2	47	69	7	12	0	137
11:30-12:30	2	51	79	8	13	0	153
11:45-12:45	0	46	79	9	11	0	145
12:00-13:00	0	47	78	7	11	0	143
12:15-13:15	0	48	83	5	12	0	148
12:30-13:30	0	58	84	6	14	0	162
12:45-13:45	1	61	101	5	13	0	181
13:00-14:00	1	61	111	7	12	0	192
13:15-14:15	1	63	110	9	8	0	191
13:30-14:30	1	51	115	8	6	0	181
13:45-14:45	0	44	101	10	6	0	161
14:00-15:00	0	52	88	12	4	0	156
14:15-15:15	0	72	78	10	4	0	164
14:30-15:30	0	86	57	11	6	0	160
14:45-15:45	0	91	66	9	5	0	171
15:00-16:00	0	81	58	6	5	0	150
15:15-16:15	0	61	60	8	8	0	137
15:30-16:30	0	45	74	7	10	0	136
15:45-16:45	0	44	51	7	9	0	111
16:00-17:00	0	44	48	5	10	0	107
16:15-17:15	0	34	38	3	9	0	84
16:30-17:30	0	31	45	2	4	0	82
16:45-17:45	1	28	89	1	5	0	124
17:00-18:00	1	33	109	4	5	0	152

APPENDIX B

TRIP INFORMATION RELATED TO THE EXISTING TRAFFIC

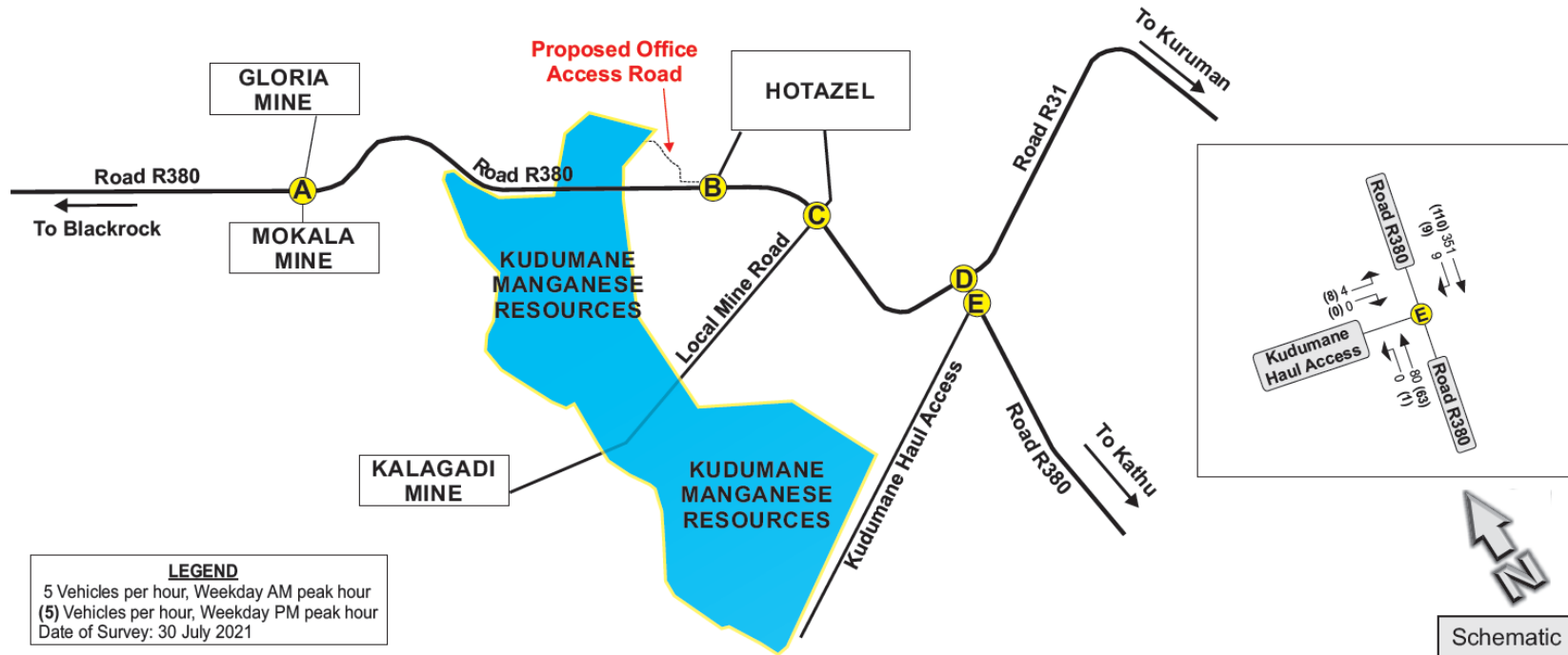
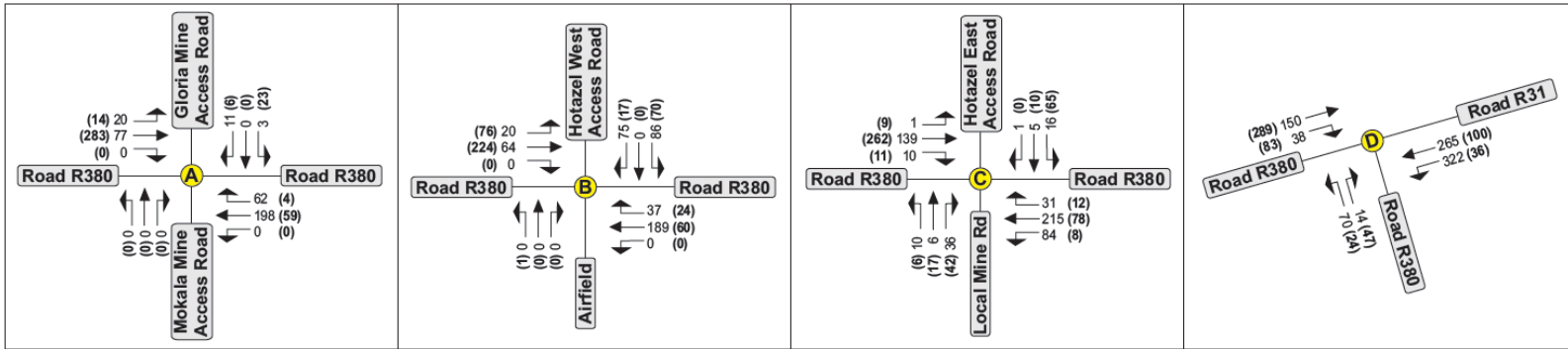


FIGURE B-1: 2021 PEAK HOUR TRAFFIC (BACKGROUND TRAFFIC) WITHOUT LATENT DEVELOPMENTS WITHOUT THE PROPOSED KMR EXPANSION PROJECT

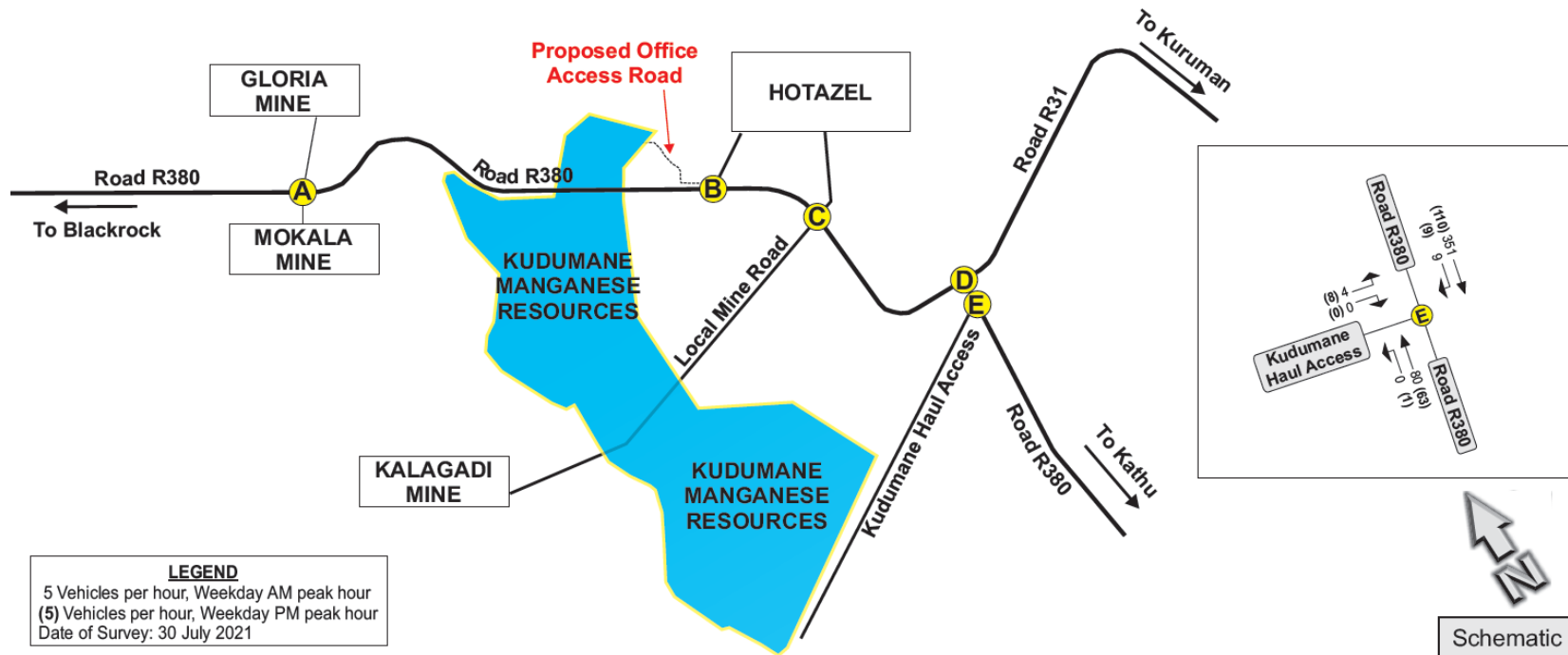
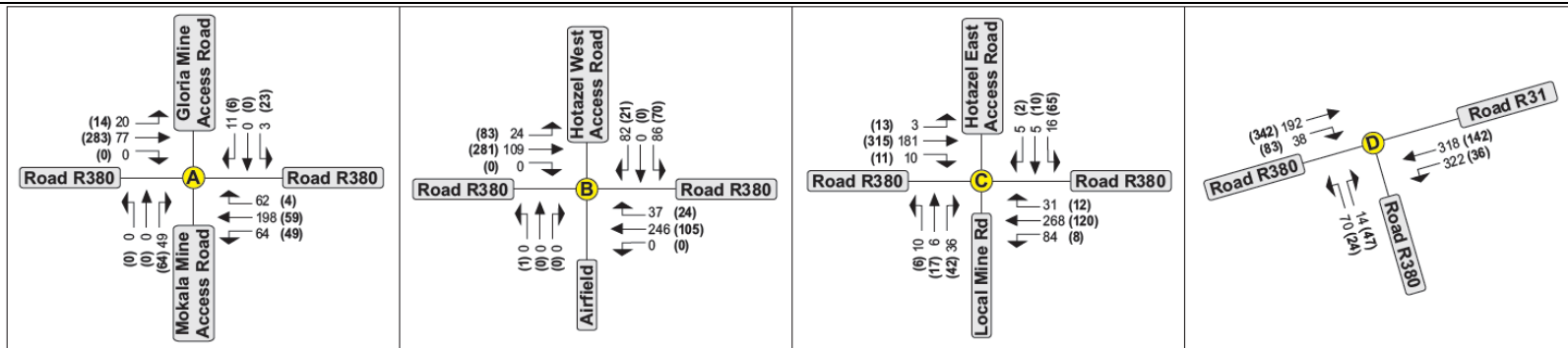


FIGURE B-2: 2021 PEAK-HOUR TRAFFIC (BACKGROUND TRAFFIC) WITH LATENT DEVELOPMENTS WITHOUT THE PROPOSED KMR EXPANSION PROJECT (SCENARIO 1)

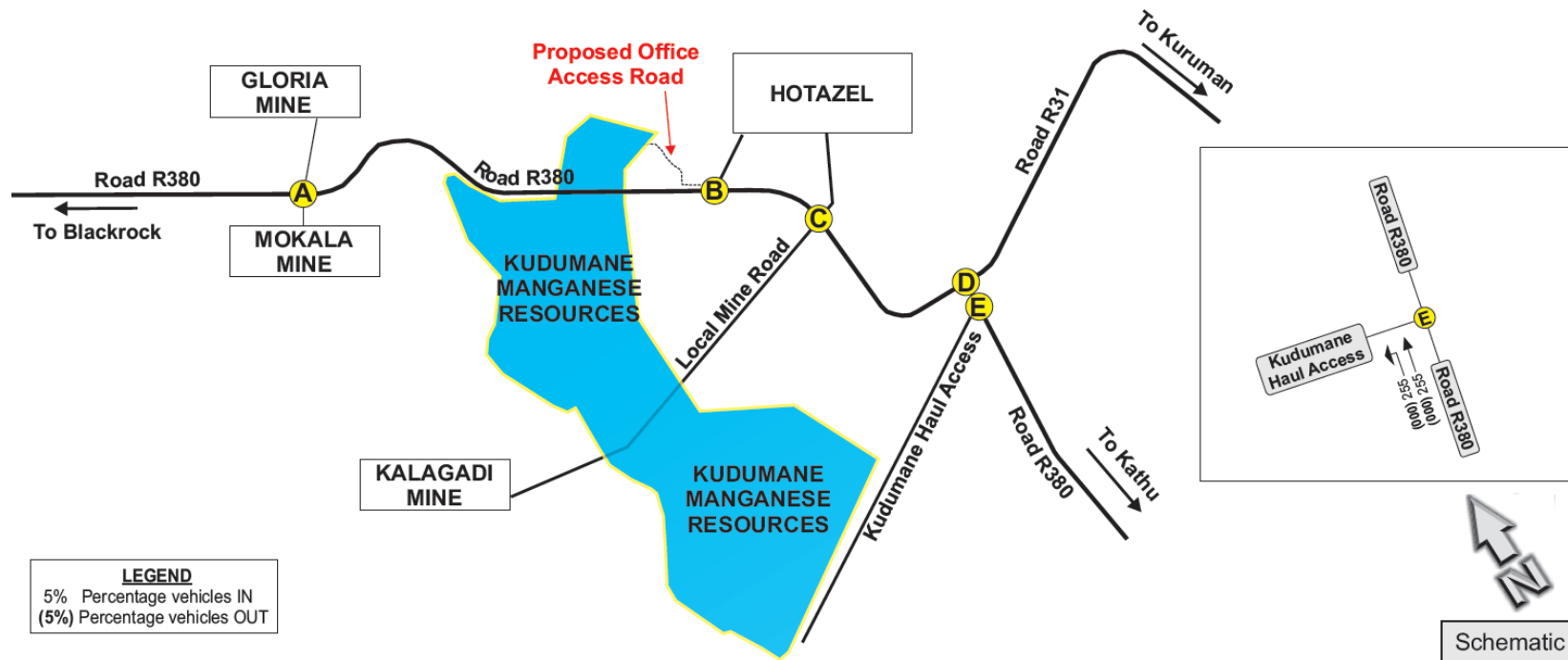
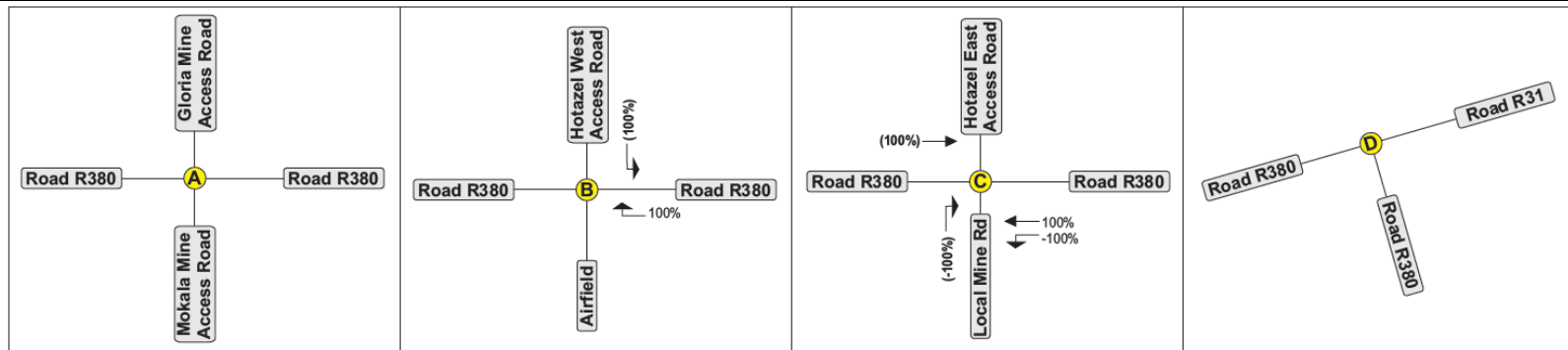
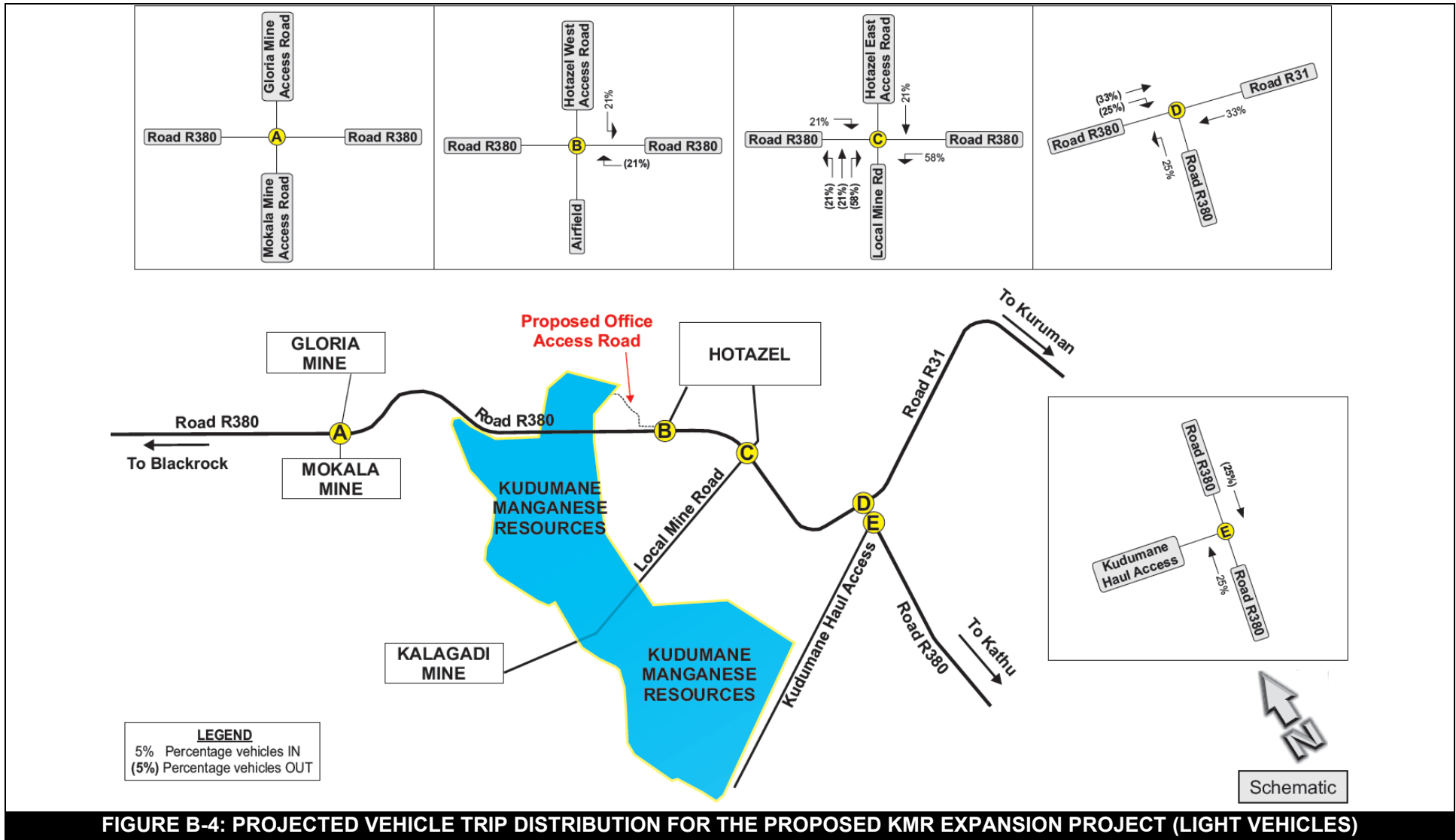
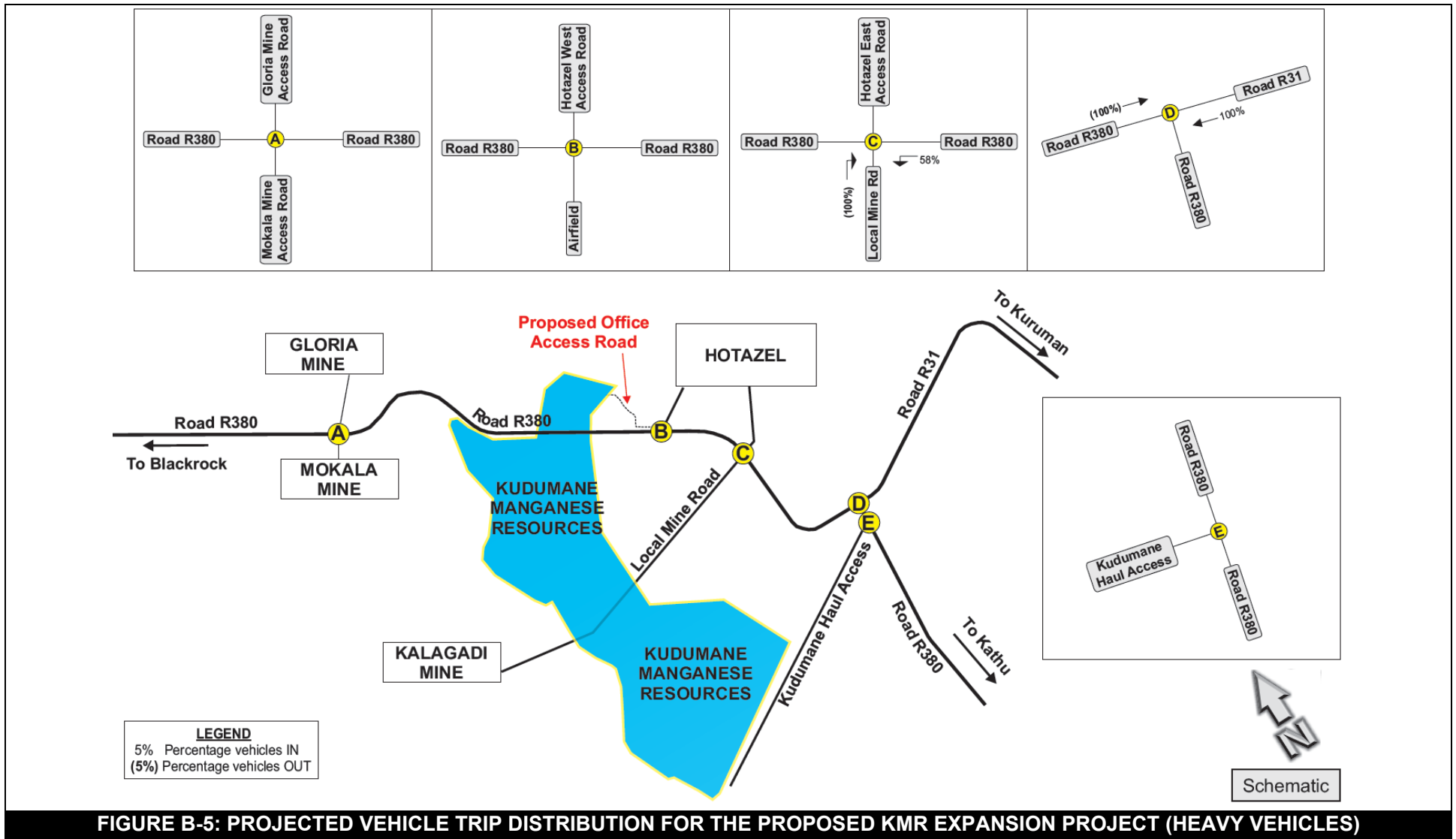
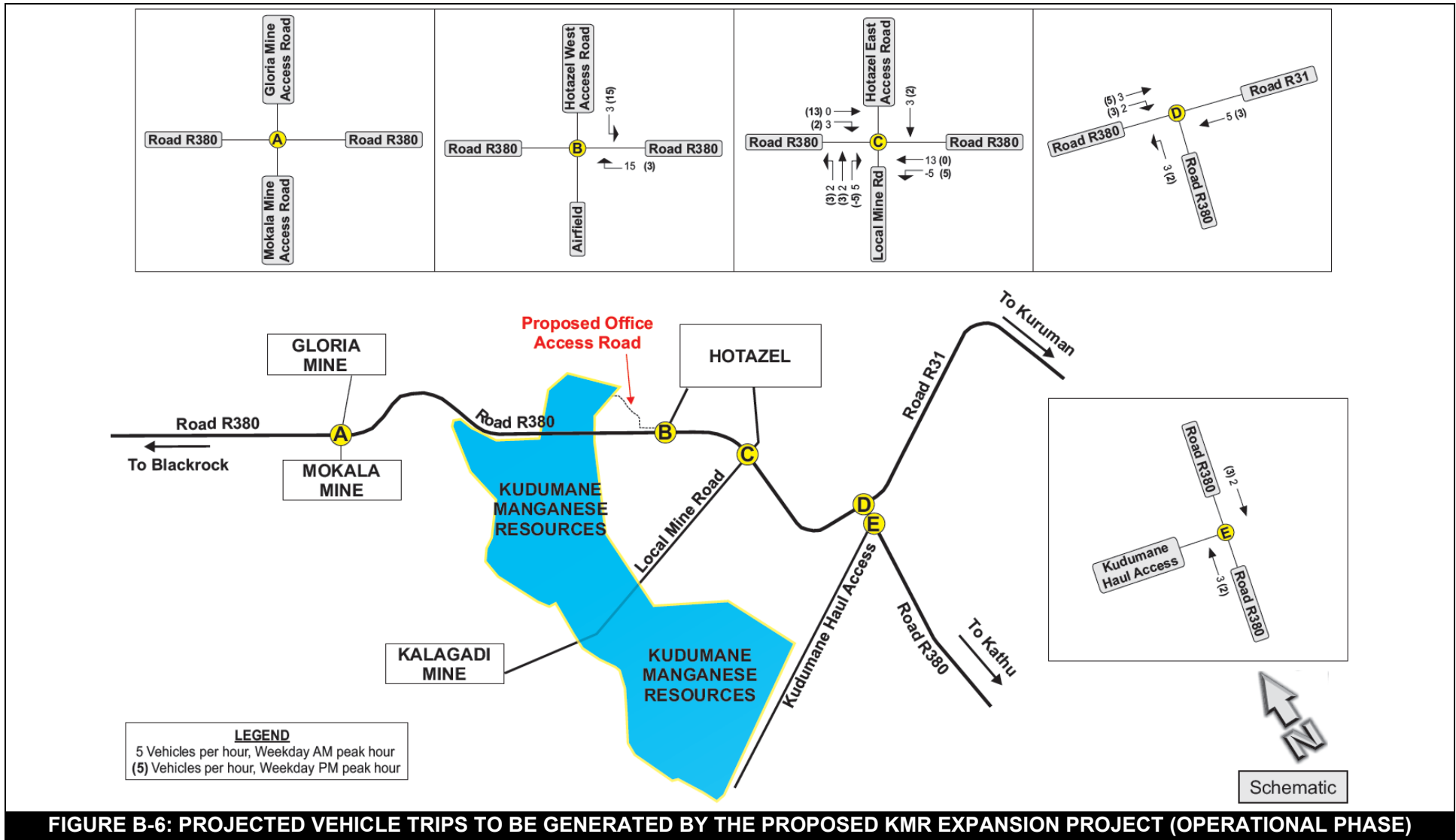


FIGURE B-3: PROJECTED VEHICLE TRIP RE-DISTRIBUTION FOR THE PROPOSED KMR EXPANSION PROJECT (ADMINISTRATIVE STAFF RELOCATION)







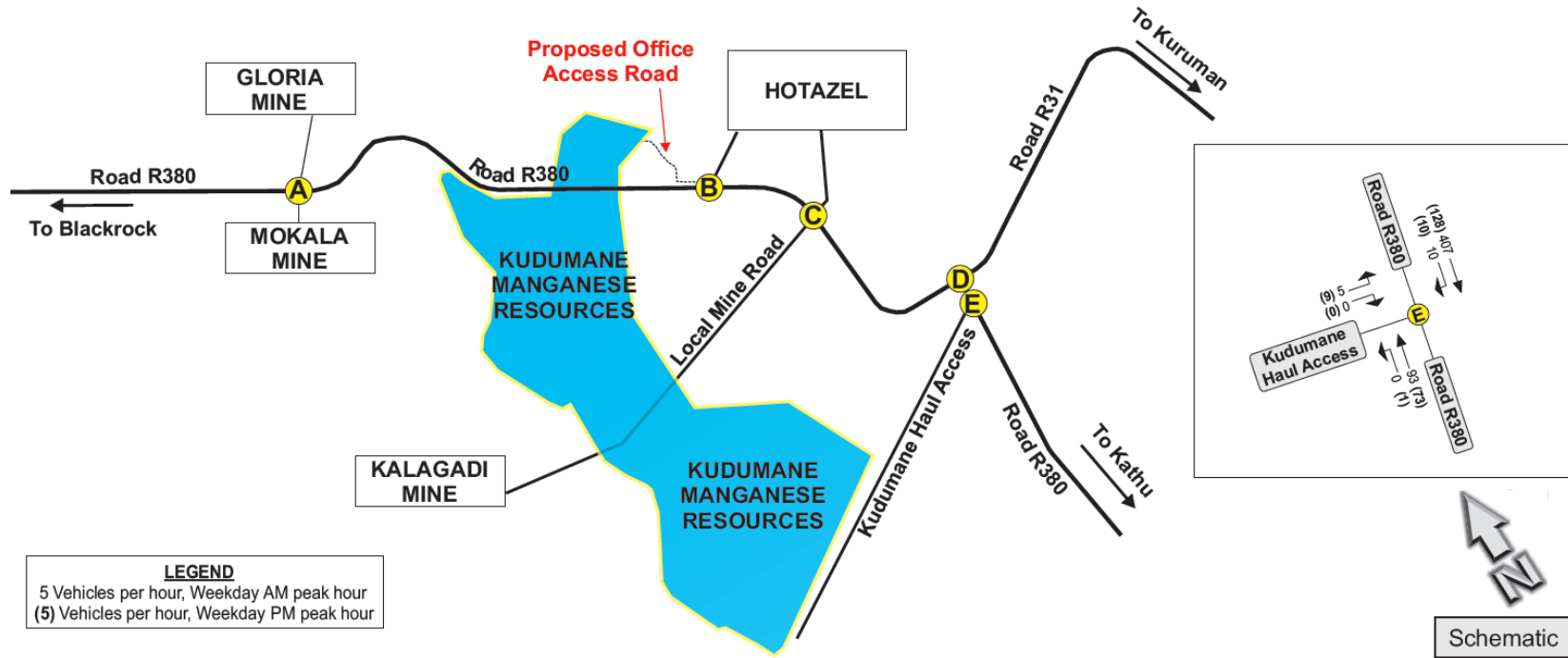
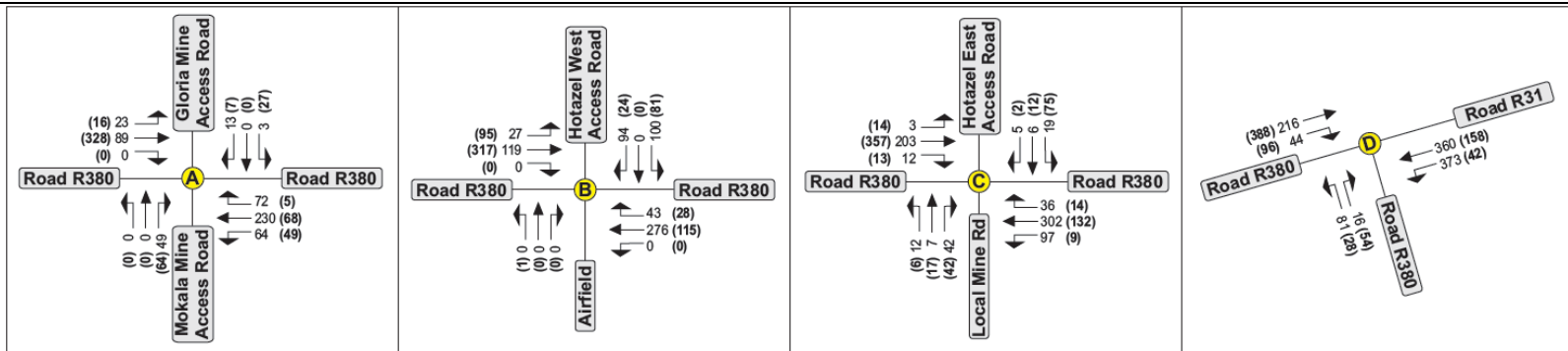


FIGURE B-8: PROJECTED 2026 PEAK-HOUR TRAFFIC WITH LATENT DEVELOPMENTS WITHOUT THE PROPOSED KMR EXPANSION PROJECT (SCENARIO 3)

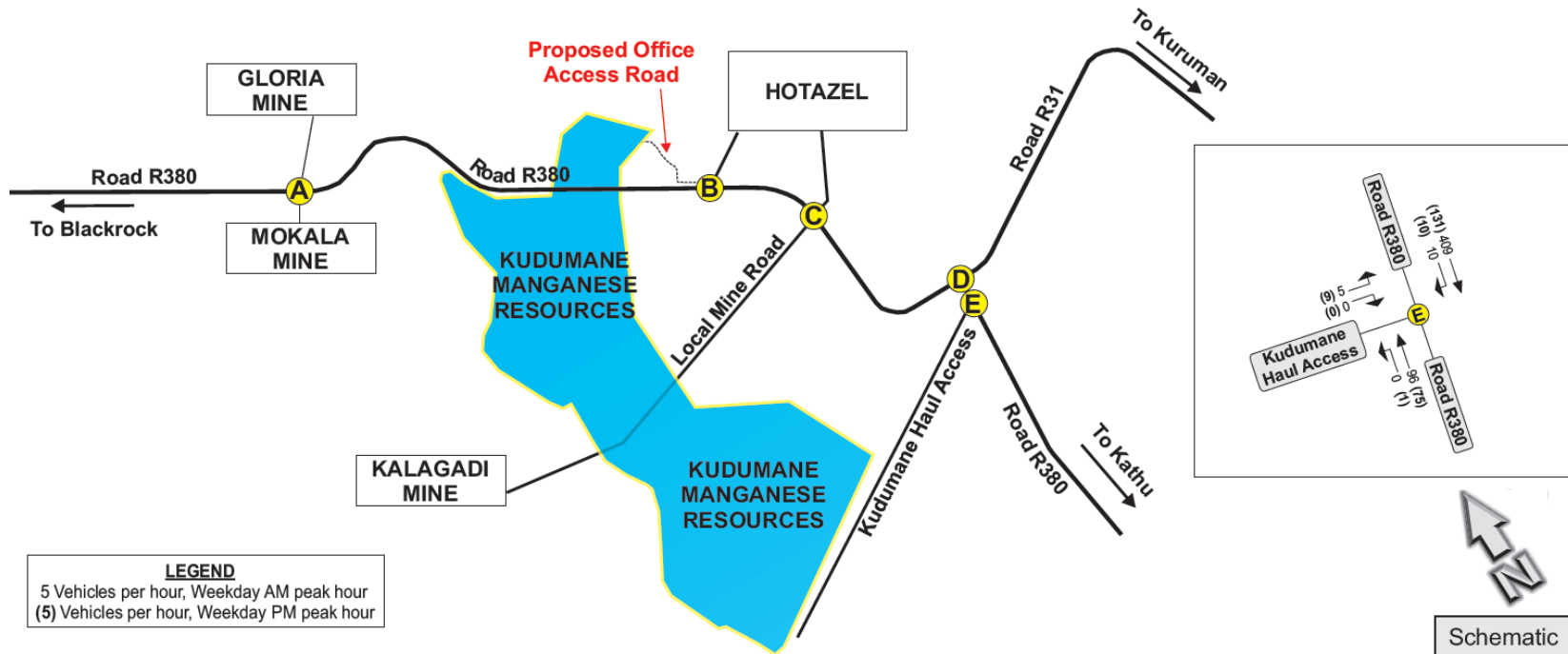
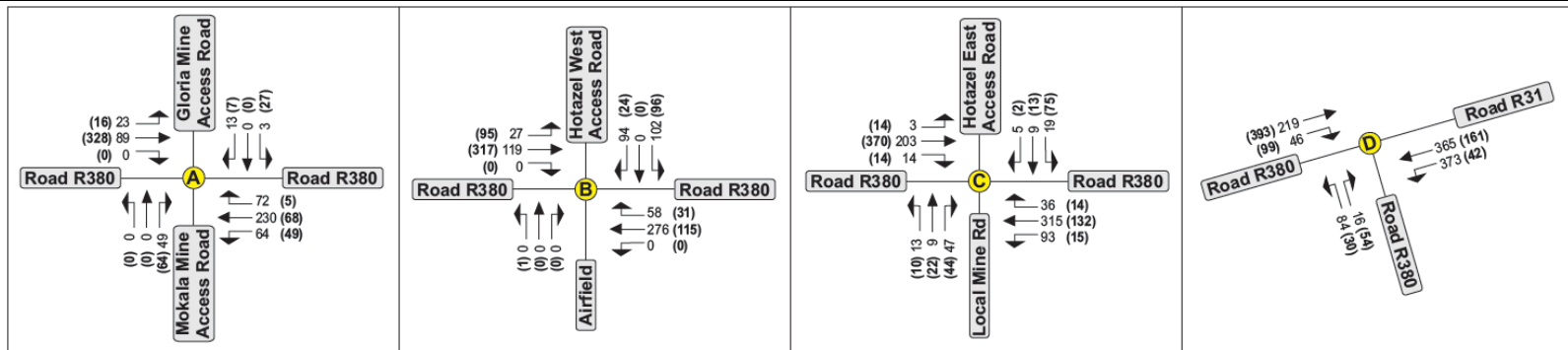


FIGURE B-9: PROJECTED 2026 PEAK-HOUR TRAFFIC WITH LATENT DEVELOPMENTS WITH THE PROPOSED KMR EXPANSION PROJECT (SCENARIO 4)

APPENDIX C

SIDRA CALCULATION RESULTS

TABLE C-1: LEVELS OF SERVICE FOR VARIOUS APPROACHES FOR THE YEAR 2021 (BACKGROUND TRAFFIC) WITH LATENT DEVELOPMENTS, WITHOUT THE PROPOSED KMR EXPANSION PROJECT (SCENARIO 1)

POINT A: Intersection of Road R380, Gloria Mine Access Road and Mokala Mine Access Road						
<i>Type of intersection control: Free flow along Road R380</i>						
Existing intersection geometry						
Levels of Service Acceptable						
APPROACH	FRIDAY (AM)			FRIDAY (PM)		
	Delay	Level of Service	Degree of Saturation	Delay	Level of Service	Degree of Saturation
North (Road R380)	1.3	A	0.055	0.3	A	0.187
East (Gloria Mine Acc)	15.5	C	0.053	8.0	A	0.027
South (Road R380)	2.3	A	0.131	2.7	A	0.039
West (Mokala Mine Acc)	17.4	C	0.206	19.7	A	0.287
Intersection	4.0	A	0.206	3.8	A	0.287
POINT B: Intersection of Road R380, Airfield Access and Hotazel West Access Road						
<i>Type of intersection control: Free flow along Road R380</i>						
Existing intersection geometry						
Levels of Service Acceptable						
APPROACH	FRIDAY (AM)			FRIDAY (PM)		
	Delay	Level of Service	Degree of Saturation	Delay	Level of Service	Degree of Saturation
North (Road R380)	11	A	0.089	1.3	A	0.264
East (Hotazel West Acc)	10.9	B	0.271	11.4	B	0.172
South (Road R380)	0.9	A	0.184	2.1	A	0.106
West (Airfield Acc)	10.5	B	0.005	11.2	B	0.007
Intersection	3.9	A	0.271	3.1	A	0.264
POINT C: Intersection of Road R380, Local Mine Road and Hotazel East Access Road						
<i>Type of intersection control: Free flow along Road R380</i>						
Existing intersection geometry						
Levels of Service Acceptable						
APPROACH	FRIDAY (AM)			FRIDAY (PM)		
	Delay	Level of Service	Degree of Saturation	Delay	Level of Service	Degree of Saturation
North (Road R380)	0.4	A	0.105	0.4	A	0.177
East (Hotazel East Acc)	13.4	B	0.057	12.8	B	0.147
South (Road R380)	1.8	A	0.149	0.9	A	0.067
West (Local Mine Road)	26.7	D	0.267	22.0	C	0.269
Intersection	3.8	A	0.267	4.3	A	0.269

TABLE C-1: LEVELS OF SERVICE FOR VARIOUS APPROACHES FOR THE YEAR 2021 (BACKGROUND TRAFFIC) WITH LATENT DEVELOPMENTS, WITHOUT THE PROPOSED KMR EXPANSION PROJECT (SCENARIO 1)

POINT D: Intersection of Road R380 and Road R31						
<i>Type of intersection control: Free flow along Road R380 / R31</i>						
Existing intersection geometry						
Levels of Service Acceptable						
APPROACH	FRIDAY (AM)			FRIDAY (PM)		
	Delay	Level of Service	Degree of Saturation	Delay	Level of Service	Degree of Saturation
East (Road R31)	2.9	A	0.235	1.2	A	0.081
South (Road R380)	13.1	B	0.189	14.3	B	0.170
West (Road R380)	1.8	A	0.133	1.3	A	0.212
Intersection	3.5	A	0.235	2.6	A	0.212
POINT E: Intersection of Road R380 and Kudumane Haul Access						
<i>Type of intersection control: Free flow along Road R380</i>						
Existing intersection geometry						
Levels of Service Acceptable						
APPROACH	FRIDAY (AM)			FRIDAY (PM)		
	Delay	Level of Service	Degree of Saturation	Delay	Level of Service	Degree of Saturation
North (Road R380)	0.2	A	0.262	0.5	A	0.080
South (Road R380)	0.1	A	0.055	0.1	A	0.045
West (Kudumane Acc)	8.9	A	0.006	10.4	B	0.010
Intersection	0.2	A	0.262	0.8	A	0.080
POINT E: Intersection of Road R380 and Kudumane Haul Access						
<i>Type of intersection control: Free flow along Road R380</i>						
Recommended intersection geometry due to road safety						
Levels of Service Acceptable						
APPROACH	FRIDAY (AM)			FRIDAY (PM)		
	Delay	Level of Service	Degree of Saturation	Delay	Level of Service	Degree of Saturation
North (Road R380)	0.2	A	0.255	0.5	A	0.074
South (Road R380)	0.1	A	0.054	0.1	A	0.045
West (Kudumane Acc)	9.7	A	0.008	10.6	B	0.012
Intersection	0.2	A	0.255	0.8	A	0.074

TABLE C-2: LEVELS OF SERVICE FOR VARIOUS APPROACHES FOR THE YEAR 2026 (BACKGROUND TRAFFIC) WITH LATENT DEVELOPMENTS, WITHOUT THE PROPOSED KMR EXPANSION PROJECT (SCENARIO 3)

POINT A: Intersection of Road R380, Gloria Mine Access Road and Mokala Mine Access Road						
<i>Type of intersection control: Free flow along Road R380</i>						
Existing intersection geometry						
Levels of Service Acceptable						
APPROACH	FRIDAY (AM)			FRIDAY (PM)		
	Delay	Level of Service	Degree of Saturation	Delay	Level of Service	Degree of Saturation
North (Road R380)	1.3	A	0.063	0.3	A	0.217
East (Gloria Mine Acc)	18.1	C	0.074	8.5	A	0.037
South (Road R380)	2.2	A	0.152	2.5	A	0.045
West (Mokala Mine Acc)	20.2	C	0.239	23.6	C	0.340
Intersection	4.1	A	0.239	4.0	A	0.340
POINT B: Intersection of Road R380, Airfield Access and Hotazel West Access Road						
<i>Type of intersection control: Free flow along Road R380</i>						
Existing intersection geometry						
Levels of Service Acceptable						
APPROACH	FRIDAY (AM)			FRIDAY (PM)		
	Delay	Level of Service	Degree of Saturation	Delay	Level of Service	Degree of Saturation
North (Road R380)	1.1	A	0.098	1.3	A	0.298
East (Hotazel West Acc)	11.9	B	0.333	12.1	B	0.216
South (Road R380)	1.0	A	0.208	2.5	A	0.122
West (Airfield Acc)	11.0	B	0.006	11.9	B	0.007
Intersection	4.3	A	0.333	3.3	A	0.298
POINT C: Intersection of Road R380, Local Mine Road and Hotazel East Access Road						
<i>Type of intersection control: Free flow along Road R380</i>						
Existing intersection geometry						
Levels of Service Unacceptable						
APPROACH	FRIDAY (AM)			FRIDAY (PM)		
	Delay	Level of Service	Degree of Saturation	Delay	Level of Service	Degree of Saturation
North (Road R380)	0.4	A	0.117	0.4	A	0.201
East (Hotazel East Acc)	14.2	B	0.072	13.9	B	0.190
South (Road R380)	1.8	A	0.168	1.0	A	0.074
West (Local Mine Road)	36.2	E	0.434	28.8	D	0.427
Intersection	5.1	A	0.434	5.7	A	0.427

TABLE C-2: LEVELS OF SERVICE FOR VARIOUS APPROACHES FOR THE YEAR 2026 (BACKGROUND TRAFFIC) WITH LATENT DEVELOPMENTS, WITHOUT THE PROPOSED KMR EXPANSION PROJECT (SCENARIO 3)

POINT C: Intersection of Road R380, Local Mine Road and Hotazel East Access Road						
<i>Type of intersection control: Free flow along Road R380</i>						
Upgrade to required intersection geometry						
Levels of Service Acceptable						
APPROACH	FRIDAY (AM)			FRIDAY (PM)		
	Delay	Level of Service	Degree of Saturation	Delay	Level of Service	Degree of Saturation
North (Road R380)	0.4	A	0.117	0.4	A	0.201
East (Hotazel East Acc)	14.2	B	0.072	13.9	B	0.190
South (Road R380)	1.	A	0.168	1.0	A	0.074
West (Local Mine Road)	33.1	D	0.375	25.6	D	0.331
Intersection	4.8	A	0.375	5.3	A	0.331
POINT D: Intersection of Road R380 and Road R31						
<i>Type of intersection control: Free flow along Road R380 / R31</i>						
Existing intersection geometry						
Levels of Service Acceptable						
APPROACH	FRIDAY (AM)			FRIDAY (PM)		
	Delay	Level of Service	Degree of Saturation	Delay	Level of Service	Degree of Saturation
East (Road R31)	3.0	A	0.272	1.2	A	0.090
South (Road R380)	14.8	B	0.252	16.2	C	0.227
West (Road R380)	2.1	A	0.272	1.3	A	0.240
Intersection	3.8	A	0.272	2.9	A	0.240
POINT E: Intersection of Road R380 and Kudumane Haul Access						
<i>Type of intersection control: Free flow along Road R380</i>						
Recommended intersection geometry due to road safety						
Levels of Service Acceptable						
APPROACH	FRIDAY (AM)			FRIDAY (PM)		
	Delay	Level of Service	Degree of Saturation	Delay	Level of Service	Degree of Saturation
North (Road R380)	0.2	A	0.296	0.4	A	0.086
South (Road R380)	0.1	A	0.063	0.1	A	0.052
West (Kudumane Acc)	10.0	A	0.010	10.7	B	0.014
Intersection	0.2	A	0.296	0.8	A	0.086

TABLE C-3: LEVELS OF SERVICE FOR VARIOUS APPROACHES FOR THE YEAR 2021 (BACKGROUND TRAFFIC) WITH LATENT DEVELOPMENTS, WITH THE PROPOSED KMR EXPANSION PROJECT (SCENARIO 2)

POINT A: Intersection of Road R380, Gloria Mine Access Road and Mokala Mine Access Road						
<i>Type of intersection control: Free flow along Road R380</i>						
Existing intersection geometry						
Levels of Service Acceptable						
APPROACH	FRIDAY (AM)			FRIDAY (PM)		
	Delay	Level of Service	Degree of Saturation	Delay	Level of Service	Degree of Saturation
North (Road R380)	1.3	A	0.055	0.3	A	0.187
East (Gloria Mine Acc)	15.5	C	0.053	8.0	A	0.027
South (Road R380)	2.3	A	0.131	2.7	A	0.039
West (Mokala Mine Acc)	17.4	C	0.206	19.7	A	0.287
Intersection	4.0	A	0.206	3.8	A	0.287
POINT B: Intersection of Road R380, Airfield Access and Hotazel West Access Road						
<i>Type of intersection control: Free flow along Road R380</i>						
Existing intersection geometry						
Levels of Service Acceptable						
APPROACH	FRIDAY (AM)			FRIDAY (PM)		
	Delay	Level of Service	Degree of Saturation	Delay	Level of Service	Degree of Saturation
North (Road R380)	1.1	A	0.089	1.3	A	0.264
East (Hotazel West Acc)	11.4	B	0.250	11.9	B	0.194
South (Road R380)	1.2	A	0.196	2.3	A	0.110
West (Airfield Acc)	10.5	B	0.005	11.3	B	0.007
Intersection	3.7	A	0.250	3.3	A	0.264
POINT C: Intersection of Road R380, Local Mine Road and Hotazel East Access Road						
<i>Type of intersection control: Free flow along Road R380</i>						
Existing intersection geometry						
Levels of Service Acceptable						
APPROACH	FRIDAY (AM)			FRIDAY (PM)		
	Delay	Level of Service	Degree of Saturation	Delay	Level of Service	Degree of Saturation
North (Road R380)	0.5	A	0.105	0.5	A	0.185
East (Hotazel East Acc)	14.0	B	0.069	13.4	B	0.162
South (Road R380)	1.7	A	0.156	1.1	A	0.067
West (Local Mine Road)	28.0	D	0.280	23.2	C	0.283
Intersection	3.9	A	0.280	4.5	A	0.283

TABLE C-3: LEVELS OF SERVICE FOR VARIOUS APPROACHES FOR THE YEAR 2021 (BACKGROUND TRAFFIC) WITH LATENT DEVELOPMENTS, WITH THE PROPOSED KMR EXPANSION PROJECT (SCENARIO 2)

POINT D: Intersection of Road R380 and Road R31						
<i>Type of intersection control: Free flow along Road R380 / R31</i>						
Existing intersection geometry						
Levels of Service Acceptable						
APPROACH	FRIDAY (AM)			FRIDAY (PM)		
	Delay	Level of Service	Degree of Saturation	Delay	Level of Service	Degree of Saturation
East (Road R31)	2.9	A	0.235	1.2	A	0.082
South (Road R380)	13.2	B	0.197	14.4	B	0.176
West (Road R380)	1.9	A	0.136	1.3	A	0.215
Intersection	3.6	A	0.235	2.6	A	0.215
POINT E: Intersection of Road R380 and Kudumane Haul Access						
<i>Type of intersection control: Free flow along Road R380</i>						
Recommended intersection geometry due to road safety						
Levels of Service Acceptable						
APPROACH	FRIDAY (AM)			FRIDAY (PM)		
	Delay	Level of Service	Degree of Saturation	Delay	Level of Service	Degree of Saturation
North (Road R380)	0.2	A	0.257	0.4	A	0.076
South (Road R380)	0.1	A	0.056	0.1	A	0.046
West (Kudumane Acc)	9.8	A	0.008	10.6	B	0.012
Intersection	0.2	A	0.257	0.8	A	0.076

TABLE C-4: LEVELS OF SERVICE FOR VARIOUS APPROACHES FOR THE YEAR 2026 (BACKGROUND TRAFFIC) WITH LATENT DEVELOPMENTS, WITH THE PROPOSED KMR EXPANSION PROJECT (SCENARIO 4)

POINT A: Intersection of Road R380, Gloria Mine Access Road and Mokala Mine Access Road						
<i>Type of intersection control: Free flow along Road R380</i>						
<i>Existing intersection geometry</i>						
<i>Levels of Service Acceptable</i>						
APPROACH	FRIDAY (AM)			FRIDAY (PM)		
	Delay	Level of Service	Degree of Saturation	Delay	Level of Service	Degree of Saturation
North (Road R380)	1.3	A	0.063	0.3	A	0.217
East (Gloria Mine Acc)	18.1	C	0.074	8.5	A	0.037
South (Road R380)	2.2	A	0.152	2.5	A	0.045
West (Mokala Mine Acc)	20.2	C	0.239	23.6	C	0.340
Intersection	4.1	A	0.239	4.0	A	0.340
POINT B: Intersection of Road R380, Airfield Access and Hotazel West Access Road						
<i>Type of intersection control: Free flow along Road R380</i>						
<i>Existing intersection geometry</i>						
<i>Levels of Service Acceptable</i>						
APPROACH	FRIDAY (AM)			FRIDAY (PM)		
	Delay	Level of Service	Degree of Saturation	Delay	Level of Service	Degree of Saturation
North (Road R380)	1.1	A	0.098	1.3	A	0.298
East (Hotazel West Acc)	12.1	B	0.342	12.0	B	0.240
South (Road R380)	1.3	A	0.221	2.6	A	0.126
West (Airfield Acc)	11.2	B	0.006	12.1	B	0.008
Intersection	4.4	A	0.342	3.5	A	0.298
POINT C: Intersection of Road R380, Local Mine Road and Hotazel East Access Road						
<i>Type of intersection control: Free flow along Road R380</i>						
<i>Existing intersection geometry</i>						
<i>Levels of Service Acceptable</i>						
APPROACH	FRIDAY (AM)			FRIDAY (PM)		
	Delay	Level of Service	Degree of Saturation	Delay	Level of Service	Degree of Saturation
North (Road R380)	0.5	A	0.117	0.4	A	0.208
East (Hotazel East Acc)	14.9	B	0.085	14.4	B	0.202
South (Road R380)	1.7	A	0.175	1.2	A	0.074
West (Local Mine Road)	34.4	D	0.386	26.9	D	0.349
Intersection	4.9	A	0.386	5.4	A	0.349

TABLE C-4: LEVELS OF SERVICE FOR VARIOUS APPROACHES FOR THE YEAR 2026 (BACKGROUND TRAFFIC) WITH LATENT DEVELOPMENTS, WITH THE PROPOSED KMR EXPANSION PROJECT (SCENARIO 4)

POINT D: Intersection of Road R380 and Road R31						
<i>Type of intersection control: Free flow along Road R380 / R31</i>						
Existing intersection geometry						
Levels of Service Acceptable						
APPROACH	FRIDAY (AM)			FRIDAY (PM)		
	Delay	Level of Service	Degree of Saturation	Delay	Level of Service	Degree of Saturation
East (Road R31)	2.9	A	0.272	1.2	A	0.092
South (Road R380)	15.0	B	0.261	16.3	C	0.234
West (Road R380)	2.2	A	0.152	1.3	A	0.243
Intersection	3.8	A	0.272	2.9	A	0.243
POINT E: Intersection of Road R380 and Kudumane Haul Access						
<i>Type of intersection control: Free flow along Road R380</i>						
Recommended intersection geometry due to road safety						
Levels of Service Acceptable						
APPROACH	FRIDAY (AM)			FRIDAY (PM)		
	Delay	Level of Service	Degree of Saturation	Delay	Level of Service	Degree of Saturation
North (Road R380)	0.2	A	0.297	0.4	A	0.088
South (Road R380)	0.1	A	0.065	0.1	A	0.053
West (Kudumane Acc)	10.0	B	0.010	10.7	B	0.014
Intersection	0.2	A	0.297	0.8	A	0.088

APPENDIX D

LEVEL OF SERVICE CRITERIA DESCRIPTION

TABLE D-1: LEVEL OF SERVICE CRITERIA DESCRIPTION FOR UNSIGNALISED INTERSECTIONS		
LEVEL OF SERVICE	AVERAGE TOTAL DELAY (SEC/VEH)	PERFORMANCE EVALUATION
A	≤ 5	Excellent
B	> 5 and ≤ 10	Very Good
C	>10 and ≤ 20	Good
D	>20 and ≤ 30	Average
E	>30 and ≤ 45	Poor
F	>45	Fail

TABLE D-2: LEVEL OF SERVICE CRITERIA DESCRIPTION FOR SIGNALISED INTERSECTIONS		
LEVEL OF SERVICE	AVERAGE TOTAL DELAY (SEC/VEH)	PERFORMANCE EVALUATION
A	≤ 5	Excellent
B	> 5 and ≤ 15	Very Good
C	> 15 and ≤ 25	Good
D	> 25 and ≤ 40	Average
E	> 40 and ≤ 60	Poor
F	> 60	Fail

Level of Service criteria obtained from *The Highway Capacity Manual (Special Report 2009)*

APPENDIX E

SUMMARY OF IMPACT RATINGS

TABLE E-1: IMPACT RATING WITHOUT THE PROPOSED KMR EXPANSION PROJECT

Nature of the impact	Significance of potential impact BEFORE mitigation						Significance	Mitigation Measures	Significance of potential impact AFTER mitigation						Significance	Degree of mitigation (%)	
	P	D	E	M	LoR	P			D	E	M	LoR					
ACTIVITY: Road and Traffic																	
Pre-construction Phase (Existing conditions without the Proposed KMR Expansion Project)																	
Road capacity: Relevant Road sections and need for repairing and/or reconstructing of road	+	3	5	2	6	3	39	Moderate	No mitigation measures required at this point. Roadways need to be monitored to determine when road surfaces require repairing.	3	5	2	6	3	39	Moderate	0,0
Road capacity: Need for additional lanes	+	2	3	2	4	1	18	Low	Road capacity calculations indicated that all relevant roads have sufficient road capacity available.	2	3	2	4	1	18	Low	0,0
Road safety: Intersection spacing	+	1	5	2	2	1	9	Low	Existing intersections.	1	5	2	2	1	9	Low	0,0
Road safety: Vertical road alignment	+	1	5	2	2	1	9	Low	Existing roads, vertical alignments acceptable.	1	5	2	2	1	9	Low	0,0
Road safety: Available sight distance at intersections	+	1	5	2	2	1	9	Low	Existing intersections.	1	5	2	2	1	9	Low	0,0
Road safety: Need for dedicated left- and right-turn lanes	-	3	4	2	6	3	36	Moderate	Dedicated right-turn lanes required at intersections B and E. Risk of vehicle accidents due to vehicles standing in roadway waiting to turn right.	1	4	2	2	1	8	Low	77,8
Road safety: Pedestrian movement within intersections	+	2	4	2	2	1	16	Low	Pedestrian walkways and crossings provided at key intersections.	2	4	2	2	1	16	Low	0,0
Road safety: Public transport loading and off-loading at intersections	+	2	4	2	2	1	16	Low	Public transport lay-bys provided at key intersections.	2	4	2	2	1	16	Low	0,0

TABLE E-2: IMPACT RATING WITH THE PROPOSED KMR EXPANSION PROJECT (CONSTRUCTION AND OPERATIONAL)

Nature of the impact	Significance of potential impact BEFORE mitigation						Significance	Mitigation Measures	Significance of potential impact AFTER mitigation						Significance	Degree of mitigation (%)	
	P	D	E	M	LoR	P			D	E	M	LoR					
ACTIVITY: Road and Traffic																	
Construction and Operational Phases																	
Road capacity: Relevant Road sections and need for repairing and/or reconstructing of road	+	3	5	2	6	3	39	Moderate	No mitigation measures required at this point. Roadways need to be monitored to determine when road surfaces require repairing.	3	5	2	6	3	39	Moderate	0,0
Road capacity: Need for additional lanes	+	2	3	2	4	1	18	Low	Road capacity calculations indicated that all relevant roads have sufficient road capacity available.	2	3	2	4	1	18	Low	0,0
Road safety: Intersection spacing	+	1	5	2	2	1	9	Low	Existing intersections.	1	5	2	2	1	9	Low	0,0
Road safety: Vertical Road alignment	+	1	5	2	2	1	9	Low	Existing roads, vertical alignments acceptable.	1	5	2	2	1	9	Low	0,0
Road safety: Available sight distance at intersections	+	1	5	2	2	1	9	Low	Existing intersections.	1	5	2	2	1	9	Low	0,0
Road safety: Need for dedicated left- and right-turn lanes	+	2	3	2	4	1	18	Low	No additional mitigation measures, as long as mitigation is implemented as indicated without the proposed KMR Expansion Project.	2	3	2	4	1	18	Low	0,0
Road safety: Pedestrian movement within intersections	+	2	4	2	2	1	16	Low	Pedestrian walkways and crossings provided at key intersections.	2	4	2	2	1	16	Low	0,0
Road safety: Public transport loading and off-loading at intersections	+	2	4	2	2	1	16	Low	Public transport lay-bys provided at key intersections.	2	4	2	2	1	16	Low	0,0

TABLE E-3: IMPACT RATING WITH THE PROPOSED KMR EXPANSION PROJECT (CLOSURE)

Nature of the impact	Significance of potential impact BEFORE mitigation						Mitigation Measures	Significance of potential impact AFTER mitigation						Degree of mitigation (%)			
	P	D	E	M	LoR	Significance		P	D	E	M	LoR	Significance				
ACTIVITY: Road and Traffic																	
Closure Phase																	
Road capacity: Relevant Road sections and need for repairing and/or reconstructing of road	+	1	1	2	2	1	5	Low	None. Mine will close down and no vehicle traffic generated.	1	1	2	2	1	5	Low	0,0
Road capacity: Need for additional lanes	+	1	1	2	2	1	5	Low	None. Mine will close down and no vehicle traffic generated.	1	1	2	2	1	5	Low	0,0
Road safety: Intersection spacing	+	1	5	2	2	1	9	Low	Existing intersections.	1	5	2	2	1	9	Low	0,0
Road safety: Vertical Road alignment	+	1	5	2	2	1	9	Low	Existing roads, vertical alignments acceptable.	1	5	2	2	1	9	Low	0,0
Road safety: Available sight distance at intersections	+	1	5	2	2	1	9	Low	Existing intersections.	1	5	2	2	1	9	Low	0,0
Road safety: Need for dedicated left- and right-turn lanes	+	1	1	2	2	1	5	Low	None. Mine will close and no vehicle traffic generated.	1	1	2	2	1	5	Low	0,0
Road safety: Pedestrian movement within intersections	+	1	1	2	2	1	5	Low	None. Mine will close and have no staff moving within intersections.	1	1	2	2	1	5	Low	0,0
Road safety: Public transport loading and off-loading at intersections	+	1	1	2	2	1	5	Low	None. Mine will close and no public transport will be required.	1	1	2	2	1	5	Low	0,0

APPENDIX F

IMPACT RATING CRITERIA

Impact Assessment Methodology

As part of the integrated environmental authorisation process, various specialist studies will need to be undertaken in support of the Environmental Impact Assessment (EIA) and the development of the Environmental Management Programme (EMPr).

All specialists are required to assess each proposed activity/aspect of the KMR Expansion Project in relation to the construction, operational, closure and decommissioning phases in order to identify the potential impacts that may be associated with such activity and to develop appropriate mitigation measures that can be implemented to reduce or eliminate the potential impacts identified.

The specialist will assess the potential impact identified according to the Impact Assessment Methodology described below. This Impact Assessment Methodology has been formalised by SRK to comply the EIA Regulations of 2014 (as amended) promulgated under NEMA, which states the following:

- *An environmental impact assessment report must contain all information that is necessary for the competent authority to consider the application and to reach a decision, and must include – an assessment of each identified potentially significant impact, including –*
 - *(i) cumulative impacts;*
 - *(ii) the nature, significance and consequence of the impact and risk;*
 - *(iii) the extent and duration of the impact and risk;*
 - *(iv) the probability of the impact and risk occurring;*
 - *(v) the degree to which the impact and risk can be reversed;*
 - *(vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and*
 - *(vii) the degree to which the impact and risk can be mitigated.*

Based on the above, the Impact Assessment Methodology requires that each potential impact identified is clearly described (providing the nature of the impact) and be assessed in terms of the following factors (see

Table 1):

- **extent** (spatial scale) - *will the impact affect the national, regional or local environment, or only that of the site?;*
- **duration** (temporal scale) - *how long will the impact last?;*
- **magnitude** (severity) - *will the impact be of high, moderate or low severity?;* and
- **probability** (likelihood of occurring) - *how likely is it that the impact may occur?*

To enable a scientific approach for the determination of the environmental significance (importance) of each identified potential impact, a numerical value has been linked to each factor.

Table 1: Risk matrix

Occurrence	Duration:	Probability:
	5 – Permanent	5 – Definite/don't know
	4 - Long-term (ceases with the operational life)	4 – Highly probable
	3 - Medium-term (5-15 years)	3 – Medium probability
	2 - Short-term (0-5 years)	2 – Low probability
	1 – Immediate	1 – Improbable
Severity		0 – None
	Extent/scale:	Magnitude:
	5 – International	10 - Very high/uncertain
	4 – National	8 – High
	3 – Regional	6 – Moderate
	2 – Local	4 – Low
	1 – Site only	2 – Minor
0 – None		

Once the above factors had been ranked for each identified potential impact, the environmental significance of each impact can be calculated using the following formula:

- $Significance = (duration + extend + magnitude) \times probability$

The maximum value that can be calculated for the environmental significance of any impact is 100.

The environmental significance of any identified potential impact is then rated as either: high, moderate or low on the following basis:

- More than 60 significance value indicates a high (H) environmental significance impact;
- Between 30 and 60 significance value indicates a moderate (M) environmental significance impact; and
- Less than 30 significance value indicates a low (L) environmental significance impact.

In order to assess the degree to which the potential impact can be reversed and be mitigated, each identified potential impact will need to be assessed twice:

- Firstly the potential impact will be assessed and rated prior to implementing any mitigation and management measures; and
- Secondly, the potential impact will be assessed and rated after the proposed mitigation and management measures have been implemented.

The purpose of this dual rating of the impact before and after mitigation is to indicate that the significance rating of the initial impact is and should be higher in relation to the significance of the impact after mitigation measures have been implemented.

In order to assess the degree to which the potential impact can cause irreplaceable loss of resources, the following classes (%) will be used and will need to select based on the specialist informed decision and discretion:

- 5 100% - Permanent loss
- 4 75% - 99% - significant loss
- 3 50% - 74% - moderate loss
- 2 25% - 49% - minor loss
- 1 0% - 24% - limited loss

Please note that the Loss of Resources aspect will not affect the overall significance rating of the impact.

In terms of assessing the cumulative impacts, specialists are required to address this in a sentence/ paragraph fashion as the spatial extent of the cumulative impacts will vary from project to project.

Cumulative impact, in relation to an activity, means the impact of an activity that in itself may not be significant, but may become significant when added to the existing or potential impacts eventuating from similar or diverse activities or undertakings in the area.

APPENDIX G

PROFESSIONAL REGISTRATION AND CURRICULUM VITAE



ENGINEERING COUNCIL OF SOUTH AFRICA

10-Sep-2021 12:59

Profile Number : ECSA-00080528
Tel : +27 82 371 0253
Email : leon@siyazi.co.za

Mr,L,Roets
P O Box 11182

Bendor Park
0713

Dear Leon Roets

RENEWAL OF REGISTRATION(s) IN TERMS OF SECTION 22(1) OF THE ENGINEERING PROFESSION ACT, 2000 (ACT 46 OF 2000)

Please be informed that your application for the renewal of your registration(s), in terms of Section 22(1) of the Engineering Profession Act, 2000 (Act 46 of 2000), has been successful and your registration(s) has been renewed for a further period of (5) years until 14-Nov-2026 00:00, subject to you paying your annual fees.

Congratulations, on the continued recognition of your status with the Engineering Council of South Africa.

Yours Faithfully

Ms Carmen Wright

Manager: Education and CPD

ecsa.co.za

ENGINEERING COUNCIL OF SOUTH AFRICA
1st Floor Waterview Corner 2 Ernst Oppenheimer Ave Bruma
Private Bag X691 Bruma Johannesburg South Africa 2026
Tel: +27 11 607 9500 | Fax: +27 11 622 9295 | E-mail: engineer@ecsa.co.za

Suid-Afrikaanse Raad vir Ingenieurswese



Hiermee word
gesertifiseer
dat

Leon Roets

geregistreer is as

Professionele Ingenieur

kragtens die Wet op die Ingenieurswese-professie van Suid-Afrika
1990 (Wet 114 van 1990)

Datum *14 November 1996*

Registrasienuommer *960547*

President

Registrateur





Die Suid-Afrikaanse Instituut van Siviele Ingenieurswese

Hiermee word gesertifiseer dat

Leon Roetz

behoorlik verkies is as

Lid

Lidnommer: 206744

van

Die Suid-Afrikaanse
Instituut van Siviele Ingenieurswese
op

29 September 2006

Uitgereik onder die seël van die Instituut
Onder resoluë van die Raad

President

Uitvoerende Direkteur





SOUTH AFRICAN ROAD FEDERATION

This is to certify that

Leon Roets

ID No: 6510145135085

Has successfully attended a 5 day course on

ROAD SAFETY AUDITS

CPD VALIDATION NUMBER: SARF14/0003/17 (5 CREDITS)

SARF

better roads

Stefan Lotter
Presenter

Innocent Jumo
SARF President

13TH JULY – 17TH JULY 2015
GAUTENG – SANRAL – NORTHERN REGION

TRANSPORT & TRAFFIC ENGINEER CV

PERSONAL PARTICULARS

Name and Surname: Leon Roets
 Identity Number: 6510145135085
 Nationality: South African
 Prof. Registration: 960547 - Professional Engineer



ACADEMIC QUALIFICATIONS

B Eng. (Civil Eng.) University of Pretoria, 1988

PROFESSIONAL MEMBERSHIP

Engineering Council of South Africa (ECSA)

EMPLOYMENT RECORD

01/2002 – Current: Traffic Engineer Technical Director to SIYAZI Group of Companies
 01/2002 – Current: Office Manager for SIYAZI Limpopo (Pty) Ltd
 01/2002 – Current: Director and shareholder, SIYAZI Holdings (Pty) Ltd, SIYAZI Limpopo, SIYAZI-Thula, SIYAZI Gauteng and SIYAZI Free State
 07/1996 – 12/2003: Office Manager for all SIYAZI activities in the Limpopo Province
 07/1996 – 12/2003: Director and shareholder, SIYAZI Transportation & Services CC
 11/1994 – 06/1996: Representative of Africon Consulting Engineers Inc., Transportation Planning Division in the then Northern Province, based in Polokwane
 08/1992 - 10/1994: Africon Consulting Engineers Inc., Transport Planning Division in Pretoria
 06/1990 - 08/1992: Lexetran, Transport Planning Division of the then Van Wyk & Louw Group

Mr Roets has a total of 24 years experience. He is a Transport and Traffic Engineer with wide experience in transportation planning and modelling, data processing as well as Traffic Impact Studies.

MR ROETS COMPLETED A CONSIDERABLE NUMBER OF TRAFFIC IMPACT STUDIES FOR ALL TYPES OF DEVELOPMENTS, WHICH VARIES FROM BASIC RESIDENTIAL DEVELOPMENTS TO MAJOR SHOPPING CENTRE DEVELOPMENTS. THE FOLLOWING PROVIDES A SUMMARY OF SOME OF THE PROJECTS SPECIFICALLY RELATED TO MINE ACTIVITY:

Project	Client
Siyazi Transport & Technical and Liaison Assistance for Tripartite Forum (Twickenham)	Rustenburg Platinum Mine Limited- Mogalakwena Section
Mogalakwena Section Mine - Road Safety	Anglo American
Existing Aquarius Platinum Mine (Rustenburg) Transport Route Investigation (Proposed ROM Ore Transport by Road from K6 and Kwezi Shafts to AQPSA Kroondal Smelter)	SLR Consulting Engineers (Metago)
Twickenham Platinum Mines Integrated Transport Management Plan	WorleyParsons
7-day Electronic Counts for Two Rivers Platinum Mines	Two Rivers Platinum Mine
Proposed Scheiding Chrome Mine, Limpopo Province	Prime Resources (Pty) Ltd
Traffic Impact Assessment for Fumani Gold Mine	Ages (Pty) Ltd
Proposed CSP and PV Solar Power Plants near Jacobsdal, Free State	SLR Consulting Engineers
Proposed Siyanda Chrome Smelter, Northam, Limpopo	SLR Consulting Engineers
Traffic assessment for AQPSA, Rustenburg	SLR Consulting Engineers
Existing PPM mine near Pilanesberg, North West Province expansion	SLR Consulting Engineers
Proposed Musonoi Mine Situated near the Town of Kolwezi, Democratic Republic of Congo: Traffic Impact Assessment	Metago Environmental Engineers (PTY) Ltd
Botswana Traffic Impact Assessment	SLR Consulting Engineers (Metago)
Proposed division of Road P50-1 near Pilanesberg	SLR Consulting Engineers (Metago)
Development of The Eastern Limb Mining Land Transport Strategy (ELM-LTS)	Steelpoort Valley Producers Forum
Proposed Kotulo Tsatsi Solar Park near Kenhardt, Northern Cape	Savannah Environmental (Pty) Ltd
Proposed Leeuw Mining Coral Mine: Utrecht KZN	SLR Consulting Engineers (Metago)
Proposed Moonlight Iron Ore Mining Development situated in the Waterberg District of the Limpopo Province: Traffic Impact Assessment	SLR Consulting Engineers (Metago)

Project	Client
Proposed Upgrading Kinsenda Copper Mine, Situated near the town of Likasi, in the DRC	SLR Consulting Engineers (Metago)
Traffic Impact Assessment for Intersection between Windhoek and Swakopmund	Metago Environmental Engineers (Pty) Ltd
Traffic Impact Assessment: Proposed Hawerklip Railway Station Situated on the Farm Matjisgoedkuil 266-IR Near Delmas	Metago Environmental Engineers (Pty) Ltd
Road Safety Project for Road R555	Steelpoort Producers Forum
Road Safety Project for Road R37, between Olifantsrivier and Burgersfort	Steelpoort Producers Forum
Kameni Product Transport Feasibility Study	Kameni
Proposed New PGM Mine Situated on the Farms Kalkfontein and Buffelshoek in the Steelpoort Area	Metago Environmental Engineers (Pty) Ltd
Proposed New Manganese Mining Operation, NCMC: Traffic Impact Assessment, Kuruman	Metago Environmental Engineers (Pty) Ltd
Project Management Road N11, Road Safety Project	Economic Sector Forum
Twickenham Public Transport System	Twickenham Platinum Mine
Road Master Plan for Mines in the Sekhukhune District	Steelpoort Producers Forum
Traffic Related Input for Realignment of Road N11	Economic Sector Forum in conjunction with SANRAL
Access to the Polokwane Smelter (Road R37)	Economic Sector Forum
Greenfield Expansion Project, Traffic Impact Assessment for Lwala Smelter	Semancor
Road R37 upgrade in Burgersfort for SANRAL	Steelpoort Producers Forum
Road Master Plan for Burgersfort	Steelpoort Producers Forum
Application to upgrade the existing Access Road D4170 to Road R37 (Modikwa Platinum Mine)	Steelpoort Producers Forum
New concentrator and smelter complex at Hemic's Bokfontein Chrome Mine on the farm Bokfontein 448 JQ near Brits in North West Province	Metago Environmental Engineers (Pty) Ltd
Proposed Development of a Manganese Mining Operation	Metago Environmental Engineers (Pty) Ltd
R555/Tweefontein Road Safety Project (Xtrata)	Xstrata Alloys Lion Ferrochrome
Traffic Related Input for Road R555	Steelpoort Producers Forum
Proposed Manganese Mining Operation On Portion 1 Of The Farm Lehating 741 Near Hotazel, Northern Cape Province	SLR Consulting Engineers (Metago)
Proposed Mokala Manganese Mine Situated Near Hotazel, Northern Cape Province	SLR Consulting Engineers (Metago)
Background Information on the Environmental Assessment for the proposed expansion of Eland Platinum Mine	Metago Environmental Engineers (Pty) Ltd
Development of an opencast and underground coal mining operation – Keaton Mine	Metago Environmental Engineers (Pty) Ltd
Mogalakwena Economic Sector, Transport related input for Mogalakwena Economic Sector	Economic Sector Forum
Traffic Counts Road R37	Steelpoort Producers Forum
Planning of multi modal facility for Burgersfort	Steelpoort Producers Forum
Provide input into traffic safety along Road R37	Steelpoort Producers Forum
Input into the transport of workers (Dilokong corridor)	Steelpoort Producers Forum
Strategy for Travel Demand Management for the Greater Tubatse Municipality and modelling for the R37 road	Steelpoort Producers Forum
Strategy to transport workers at the Modikwa Shaft	Modikwa Mine

SOME OF MR ROETS' OTHER TRAFFIC AND TRANSPORT ENGINEERING EXPERTISE AND EXPERIENCE INCLUDE THE FOLLOWING:

- | |
|---|
| a) Shopping Centres that Range from 2 000 m ² to 60 000 m ² |
| b) Various Filling Station Developments |
| c) Integrated Transport Plans for Various Local and District Municipalities <ul style="list-style-type: none"> • Vhembe • Ba-Phalaborwa • Polokwane • Sekhukhune • Thulamela • Limpopo • Mogalakwena |
| d) Public Transport Plans for Various Local and District Municipalities <ul style="list-style-type: none"> • Mopani • Vhembe • Tubatse • Capricorn |
| e) Design and Layout of Traffic Light System |
| f) Residential Development that vary from 100 to 12 000 stands |

In conclusion the following are relevant:

The above-mentioned successful projects are a clear indication that Mr Roets is fully committed to sustainable development, and believes strongly in the following principles:

- a) Providing safe, secure and reliable traffic-related facilities
- b) Maintaining a balance between traffic engineering and the potential to create job opportunities. In other words, doing everything possible to take certain measures that would ensure the functionality of the proposed developments
- c) Acting as a link between the developer and the relevant authority to ensure that development takes place successfully
- d) Using his knowledge of local circumstances and conditions to the benefit of the local community, in order to stimulate job creation
- e) Using his expertise, experience and qualifications to best effect in the belief that these should serve as a catalyst for job creation as far as is practically possible.

Leon Roets has the distinct advantage of possessing profound knowledge of transport and traffic issues of engineering. This in-depth knowledge in various fields, combined with the extensive knowledge that Siyazi has gained and also his record of successful co-operation with transport-related role players, his knowledge of the road network and the transport environment, probably makes Leon Roets one of the best candidates to provide traffic-related input for this project.

SOME OF THE TRANSPORT PLANNING PROJECTS THAT LEON ROETS HAD BEEN INVOLVED IN THE LIMPOPO PROVINCE INCLUDE:

Authority / Project Description	Transport Forum	CPTA	OLS	RATPlan	PTP	ITP	LITP	DITP	Business Plans	Liaison	Public Transport Intermodal Facilities	Public Transport Facilities	Colour Coding	Transport Framework	Corridor Planning	Year
Technical Advisor – Taxi Industry Polokwane Integrated Rapid Transit									Y	Y		Y			Y	2015-2011
Elim Mall, Tzaneng Mall, Tzaneen Crossing, Tzaneen Lifestyle Centre, Burgersfort Mall, Malamulele												Y				2012-1998
Greater Tubatse Municipality	Y									Y						2013-2003
Road R37 between Polokwane and Burgersfort (Dllokong Corridor)										Y					Y	2013-2003
Polokwane Intermodal Facilities, as part of Prism Consortium (Planning)											Y					2013-2010
Thohoyandou Intermodal Facilities, as part of MCE Consortium											Y					2013-2010
Giyani Intermodal Facility, Taxi Facilitation												Y				2013-2010
Giyani, Makhado, Thohoyandou, Burgersfort, Special advisor for Intersite								Y								2010
Vhembe District Municipality																2009-2007
Burgersfort, Road Master Network															Y	2009-2006
Mogalakwena Local Municipality	Y															2008
Ba-Phalaborwa Local Municipality					Y											2008
Mogalakwena Local Municipality							Y									2008
Mogalakwena, Relocation and Road Safety of Road N11															Y	2008
Fetakgomo Local Municipality	Y															2007-2005
Polokwane, 2010 Priority Statement (PTIS)									Y							2007-2005
Polokwane Local Municipality					Y	Y										2007
Mogalakwena Local Municipality					Y											2007
Polokwane Local Municipality	Y															2006-1997
Sekhukhune District Municipality					Y	Y										2006
Taxi Recapitalisation for Limpopo Department of Roads & Transport									Y							2005-2004
Limpopo Department of Roads and Transport													Y			2004
Part of team for Limpopo in Motion														Y		2004
Greater Tubatse Municipality																2003
Capricorn District Municipality		Y	Y	Y	Y	Y										2003
Vhembe District Municipality		Y	Y	Y	Y	Y										2003
Mopani District Municipality		Y	Y	Y	Y	Y										2003
Pietersburg-Polokwane Transport Strategy						Y										2000
Polokwane, N1 Eastern bypass															Y	2000
Pietersburg-Polokwane Public Transport Strategy					Y											1997