

***Komati Power Station Repurposing
Transport Impact Assessment – Scoping Report
Scoping Report***

WSP Group Africa

June 2022

SUMMARY SHEET

Report Type	Transport Impact Assessment – Scoping Report
Title	Komati Power Station Repurposing
Location	Steve Tshwete Local Municipality
Client	WSP Group Africa
Reference Number	ITS 4484
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1 INTRODUCTION

The proposed development consists of Photovoltaic (PV) solar energy facilities (SEF) with ancillary Battery Energy Storage Systems (BESS), to generate a total of 150 MW of energy, located on various Eskom owned land parcels surrounding the existing Komati Power Station, Middelburg, Mpumalanga, refer to **Annexure A, Figure A1** for the locality map. Komati Power Station is located approximately 40 km south of Middelburg within the Steve Tshwete Local Municipality.

In this TIA, the impact of the additional traffic of the proposed developments on the road network will be investigated and mitigation measures will be proposed if required. The transportation activities will include transportation activities during the construction phase as well as transportation activities during the operational phase.

2 PROPOSED DEVELOPMENT AND LAND USE

The proposed development is located on Eskom property and is currently zoned for various land uses including mining and an airstrip. Permission for the applicable land use rights will have to be obtained from the relevant authorities through a town planning process.

The proposed 150 MW PV facilities are proposed to be spread over two sites shown in the development layout as PV Site A and PV Site B.

3 TRIP GENERATION

The trip generation of the proposed developments will be calculated based on the estimated number of person trips and truck trips during the construction of the different sites. The operational phase of each site will also develop a certain number of person trips.

The estimated number of person trips will be converted into vehicle trips for the phases and sites. It is expected that the trip generation of the proposed sites will be low to medium during the construction and low to very low during the operational phase.

The expected number of person trips based on the employment opportunities for the developments is 1 285 during the construction phase and 150 person trips during the operational phase. The number of vehicle trips will be adjusted for public transport usage.

The trip assignment of the proposed developments will be calculated based on the land use and traffic patterns once the relevant information has been finalised.

4 EXISTING ROAD NETWORK

The roads in the vicinity of the proposed development are as follows:

- **R543:** Is a Class 3 provincial road and is located to the south of the proposed PV Site A and the town of Komati. This road serves as an East-West link between the R544 and the R35.
- **R35:** Is a Class 3 provincial road and is located to the northeast of the proposed developments and the town of Komati. This road serves as the link between Middelburg and Bethal.
- **Main Road:** Is a Class 4 municipal road and borders the proposed developments on the western boundaries of PV Site A and PV Site B.
- **Flamingo Street:** Is a Class 5 municipal road and borders the proposed PV Site A on the northern boundary of the site. Flamingo Street also provides access to the town of Komati.

The locations of these roads relative to the proposed development are shown on the locality map in **Annexure A, Figure A1**.

5 ACCESS

Access to the proposed developments is proposed from Flamingo Street for PV Site A and from the current road that borders the airfield for PV Site B respectively.

6 TRAFFIC VOLUMES

6.1 Background Traffic Volumes 2022

Traffic counts were conducted, at the intersections shown in **Figure A2 in Annexure A**, covering a 12-hour period on Wednesday, 1 June 2022. The counts conducted were used for the 2022 base year traffic. The background weekday AM and PM peak hour traffic volumes for 2022 are shown in **Annexure B**.

6.2 Future Background Traffic Volumes 2024

A growth rate of 2% per annum was applied to the 2022 background peak hour volumes to estimate the future background volumes for the 2024 horizon year. The horizon year 2024 was chosen to align with the estimated construction period. The estimated background AM and PM peak hour traffic volumes for 2024 are shown in **Annexure B**.

6.3 Future Background Traffic Volumes 2027

A growth rate of 2% per annum was applied to the 2022 background peak hour volumes to estimate the future background volumes for the 2027 horizon year. The horizon year 2027 was chosen as it is 5 years from the start of the project and it is expected that operations will have started within a 5 year period. The estimated background AM and PM peak hour traffic volumes for 2027 are shown in **Annexure B**.

7 CAPACITY ANALYSIS

PTV Vistro software was used to conduct the capacity analysis for the intersections included in the study area. The intersections that were included in the analysis are:

- Int 1 – Main Road / Koorfontein Mine Access
- Int 2 – R542 / Main Road
- Int 3 – R35 / R542 to Emalahleni
- Int 4 – R35 / R542 to Hendrina
- Int 5 – R35 / Komati Power Station
- Int 6 – Main Road / Flamingo St

The scenarios that were analysed for the peak hours are summarised in **Table 1**.

Table 1: Scenarios Analysed for the Proposed Komati PV Developments

No	Scenario No	Scenario
1	Scenario 1	2022 AM and PM Weekday Peak Hour Background Traffic with Existing Geometry.
2	Scenario 2	2024 AM and PM Weekday Peak Hour Background Traffic with Existing Geometry.
3	Scenario 3	2027 AM and PM Weekday Peak Hour Background Traffic with Existing Geometry.

The capacity analysis results for the intersections included in the study area are summarised in **Table 2** and **Table 3**. Refer to **Annexure B** for the PTV Vistro output.

Table 2: Capacity Analysis Results for the Weekday AM Peak Hour

Scenario	Intersection	INT 1	INT 2	INT 3	INT 4	INT 5	INT 6
Scenario 1: 2022 AM Peak Hour Traffic with existing geometry	LOS	A	A	A	A	B	A
	Del	9.02	9.22	9.91	9.96	10.81	8.94
	v/c	0.03	0.02	0.05	0.08	0.04	0.02
Scenario 2: 2024 AM Peak Hour with existing geometry	LOS	A	A	A	A	B	A
	Del	9.04	9.25	9.97	10.04	10.93	8.96
	v/c	0.03	0.03	0.05	0.08	0.04	0.02
Scenario 3: 2027 AM Peak Hour with existing geometry	LOS	A	A	A	A	B	A
	Del	9.08	9.31	10.09	10.14	11.09	8.99
	v/c	0.03	0.03	0.05	0.09	0.04	0.03

Table 3: Capacity Analysis Results for the Weekday PM Peak Hour

Scenario	Intersection	INT 1	INT 2	INT 3	INT 4	INT 5	INT 6
Scenario 1: 2022 AM Peak Hour Traffic with existing geometry	LOS	A	B	B	B	B	A
	Del	9.53	10	11.81	10.99	10.86	9.24
	v/c	0	0.02	0.11	0.12	0.02	0.01
Scenario 2: 2024 AM Peak Hour with existing geometry	LOS	A	B	B	B	B	A
	Del	9.54	10.07	11.98	11.1	10.97	9.27
	v/c	0	0.02	0.11	0.12	0.03	0.01
Scenario 3: 2027 AM Peak Hour with existing geometry	LOS	A	B	B	B	A	A
	Del	9.57	10.16	12.28	11.32	11.15	9.32
	v/c	0	0.03	0.13	0.13	0.03	0.01

The existing road network is operating at acceptable levels of service with the existing geometry. The future background traffic scenarios are also expected to operate at acceptable levels of service with the existing geometry. The existing geometry of the road network is shown schematically in **Annexure A** in **Figure A3**.

8 PUBLIC TRANSPORT

Due to the locality of the proposed developments, no formal public transport facilities are located in close approximation to the proposed development. It is unlikely that public transport facilities will be required.

9 ENVIRONMENTAL IMPACT OF THE TRANSPORT ACTIVITIES

The environmental impact of the transport activities for the PV developments will be assessed and quantified according to the prescribed impact tables as provided. The assessment based on available data is shown below.

The impact of the transport activities for both the construction phase and operational phase of the project will be assessed based on the following parameters and scoring as provided in the impact tables:

- Impact Magnitude (M)
- Impact Extent (A)
- Impact Reversibility (R)
- Impact Duration (D)
- Probability of Occurrence (P)
- Significance Rating [$S = (E + D + R + M) \times P$]

Table 4: Impact Assessment Criteria and Scoring System

CRITERIA	SCORE 1	SCORE 2	SCORE 3	SCORE 4	SCORE 5
Impact Magnitude (M) The degree of alteration of the affected environmental receptor	Very low: No impact on processes	Low: Slight impact on processes	Medium: Processes continue but in a modified way	High: Processes temporarily cease	Very High: Permanent cessation of processes
Impact Extent (E) The geographical extent of the impact on a given environmental receptor	Site: Site only	Local: Inside activity area	Regional: Outside activity area	National: National scope or level	International: Across borders or boundaries
Impact Reversibility (R) The ability of the environmental receptor to rehabilitate or restore after the activity has caused environmental change	Reversible: Recovery without rehabilitation		Recoverable: Recovery with rehabilitation		Irreversible: Not possible despite action
Impact Duration (D) The length of permanence of the impact on the environmental receptor	Immediate: On impact	Short term: 0-5 years	Medium term: 5-15 years	Long term: Project life	Permanent: Indefinite
Probability of Occurrence (P) The likelihood of an impact occurring in the absence of pertinent environmental management measures or mitigation	Improbable	Low Probability	Probable	Highly Probability	Definite
Significance (S) is determined by combining the above criteria in the following formula:	$[S = (E + D + R + M) \times P]$ <p><i>Significance = (Extent + Duration + Reversibility + Magnitude) × Probability</i></p>				
IMPACT SIGNIFICANCE RATING					
Total Score	4 to 15	16 to 30	31 to 60	61 to 80	81 to 100
Environmental Significance Rating (Negative (-))	Very low	Low	Moderate	High	Very High
Environmental Significance Rating (Positive (+))	Very low	Low	Moderate	High	Very High

The initial assessment of the transportation activities for the proposed developments are shown in the tables below:

Table 5: Environmental Impact Assessment for Construction Phase

CONSTRUCTION

Impact number	Aspect	Description	Stage	Character	Ease of Mitigation	Pre-Mitigation							Post-Mitigation						
						(M+	E+	R+	D)x	P=	S	Rating	(M+	E+	R+	D)x	P=	S	Rating
Impact 1:	Transportation	Impact of construction vehicles on roads and access roads	Construction	Negative	Moderate	1	1	2	2	5	30	N2	1	1	2	2	5	30	N2
Significance						N2 - Low							N2 - Low						

Table 6: Environmental Impact Assessment for Operational Phase

OPERATIONAL

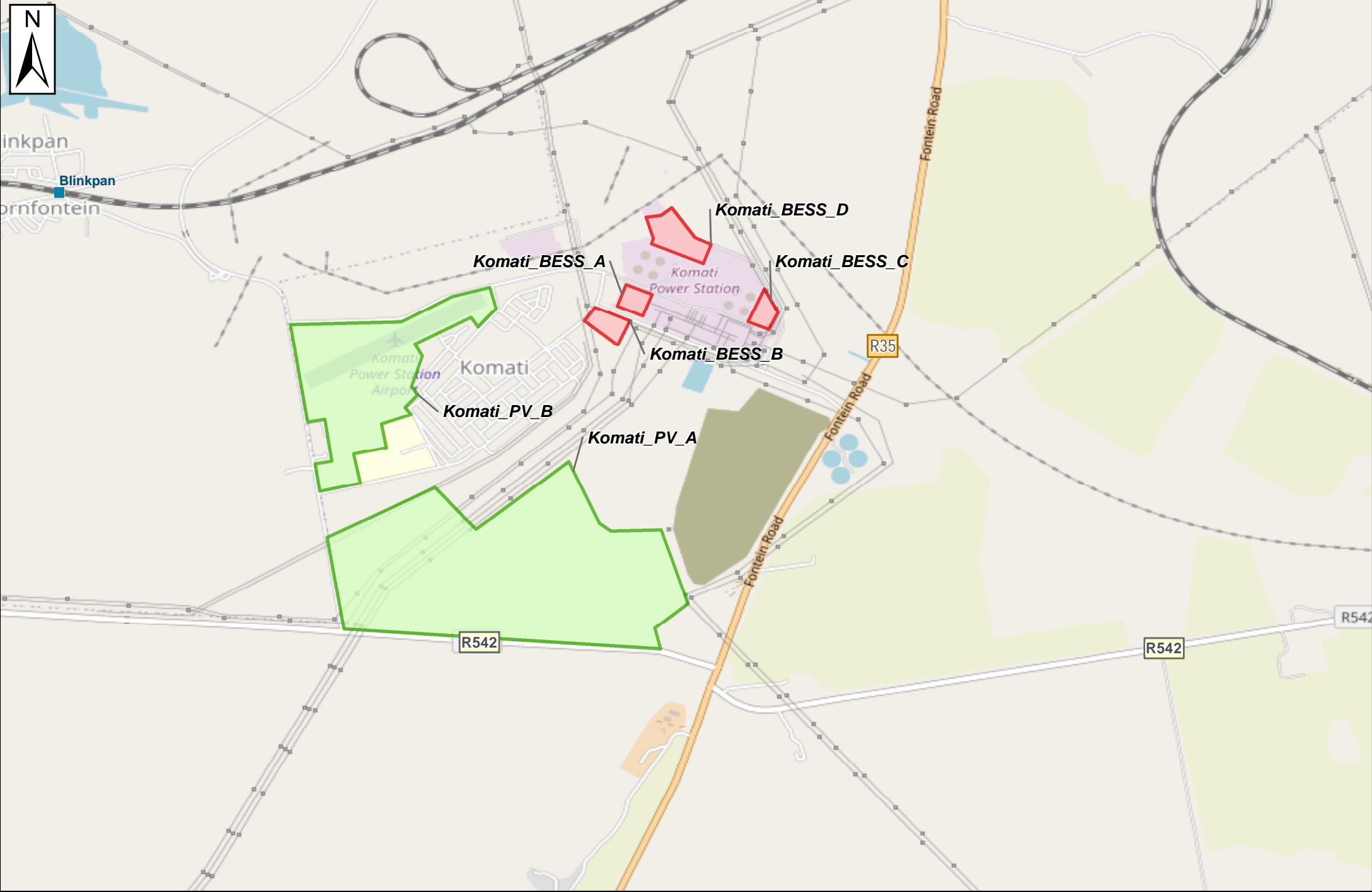
Impact number	Receptor	Description	Stage	Character	Ease of Mitigation	Pre-Mitigation							Post-Mitigation						
						(M+	E+	R+	D)x	P=	S	Rating	(M+	E+	R+	D)x	P=	S	Rating
Impact 1:	Transportation	Transportation activities during operations	Operational	Negative	Moderate	1	1	1	4	5	35	N3	1	1	1	4	5	35	N3
Significance						N3 - Moderate							N3 - Moderate						

10 REFERENCES

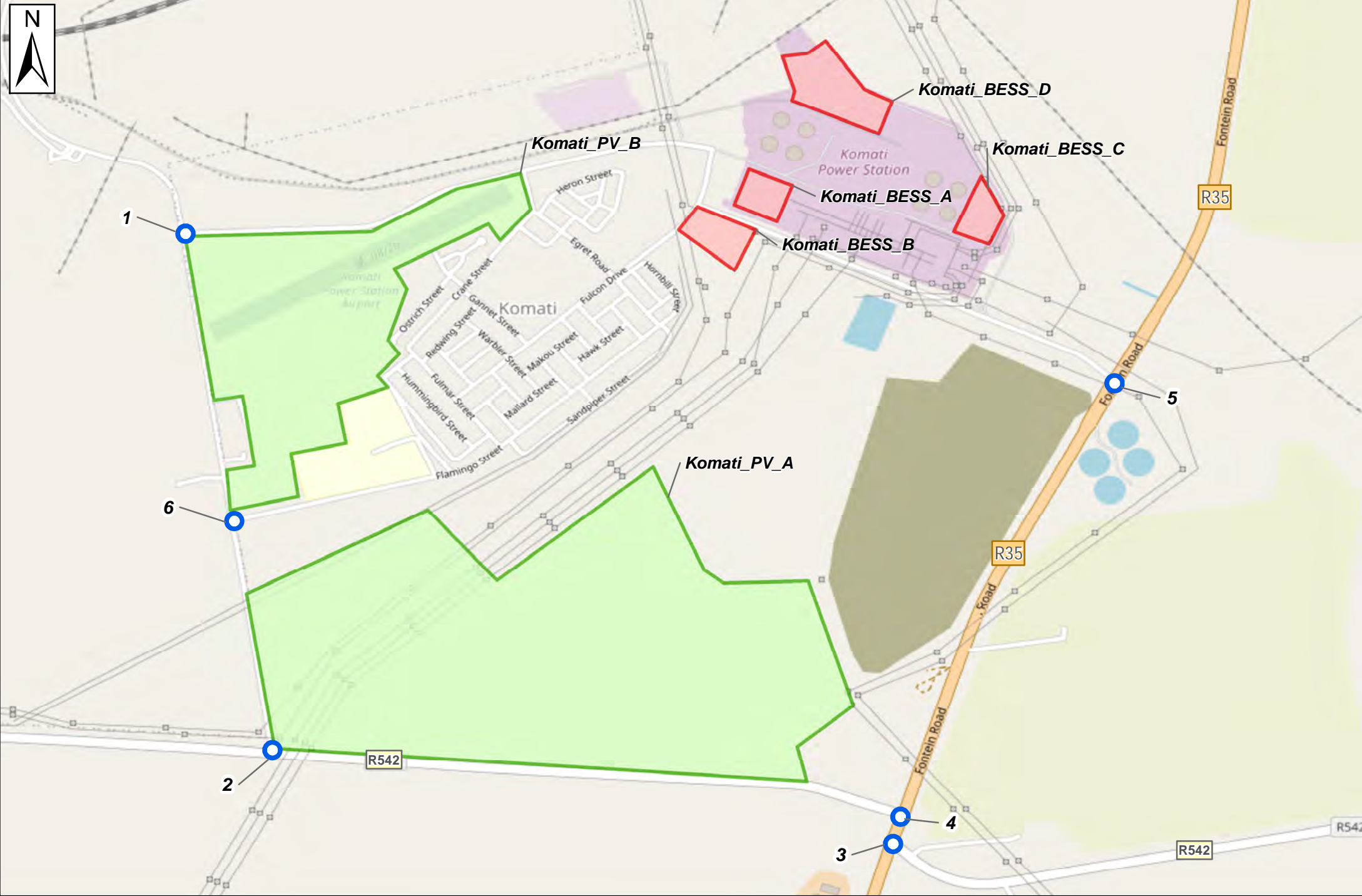
- [1] Committee of Transport Officials (COTO) Technical Methods for Highways (TMH 17) Volume 1
“South African Trip Data Manual.
- [2] Committee of Transport Officials (COTO) Technical Methods for Highways (TMH 16) Volume 1,
South African Traffic Impact and Site Traffic Assessment Standards Manual, August 2012.
- [3] Committee of Transport Officials (COTO) Technical Methods for Highways (TMH 16) Volume 2,
South African Traffic Impact and Site Traffic Assessment Standards and Requirements Manual,
August 2012.

Annexure A

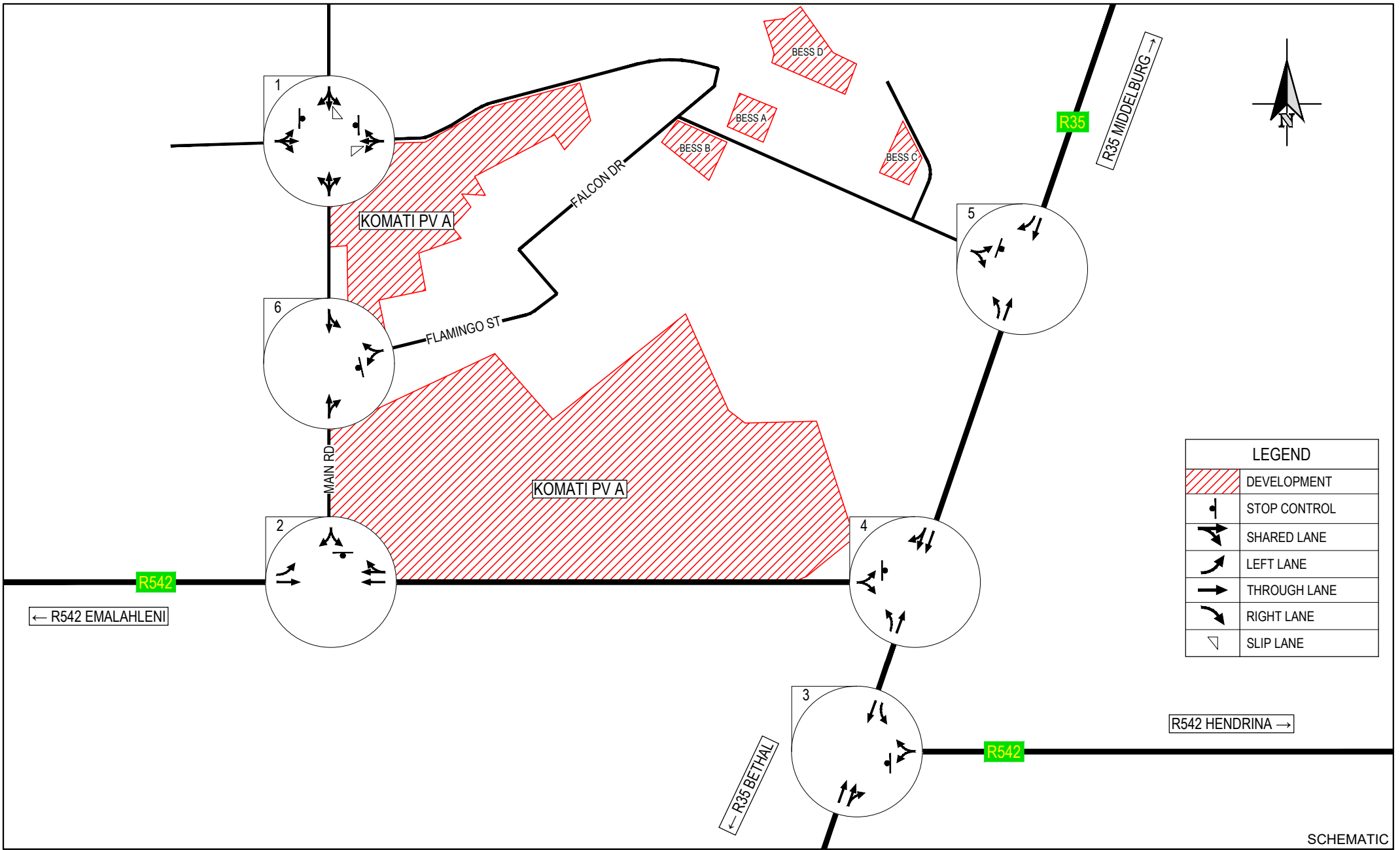
Figures



PROJECT: KOMATI POWER STATION TIA	MAP: LOCALITY MAP	NO: 4484 /Fig A1 A1
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	PROJECT: KOMATI POWER STATION TIA	MAP: INTERSECTIONS COUNTED	SCALE: 1:18 000	NO: A2
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LEGEND	
	DEVELOPMENT
	STOP CONTROL
	SHARED LANE
	LEFT LANE
	THROUGH LANE
	RIGHT LANE
	SLIP LANE

SCHMATIC



PROJECT:
KOMATI POWER STATION TIA

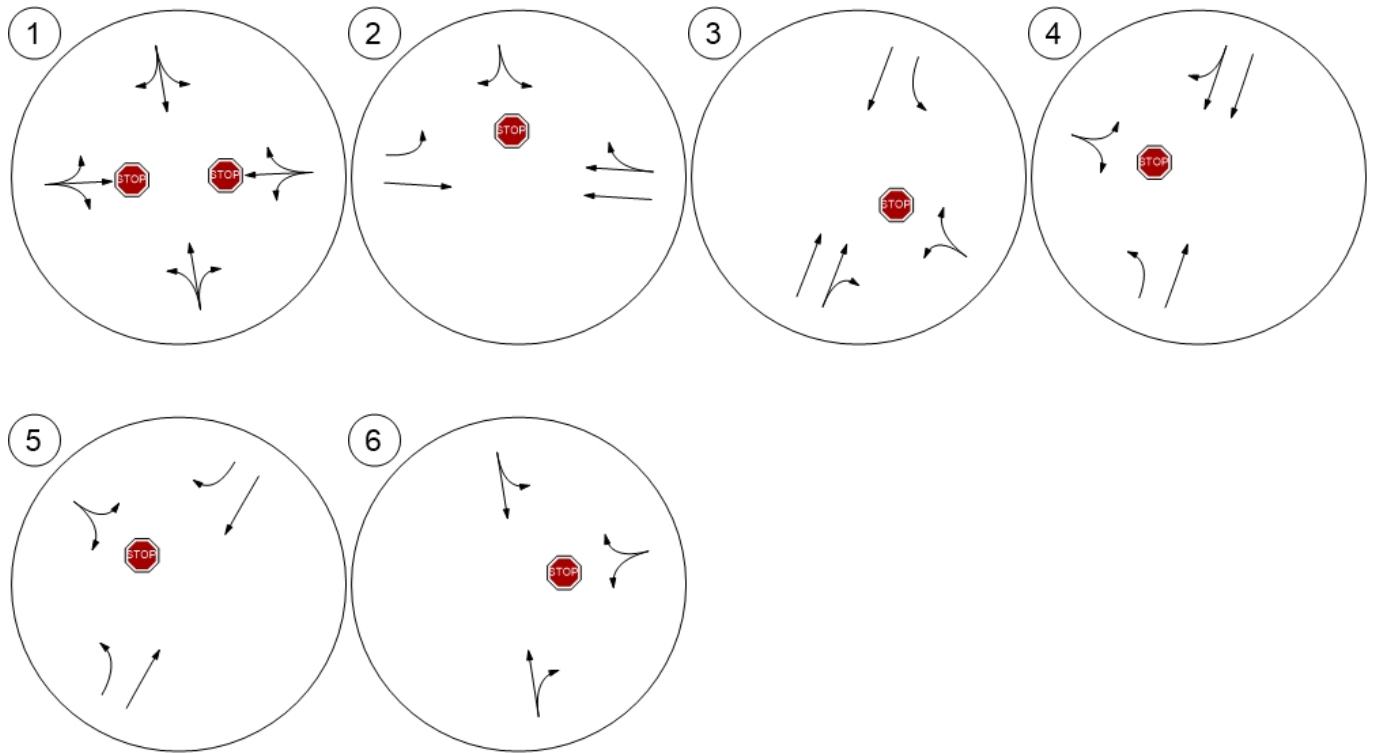
FIGURE:
EXISTING GEOMETRY

NUMBER:
A3

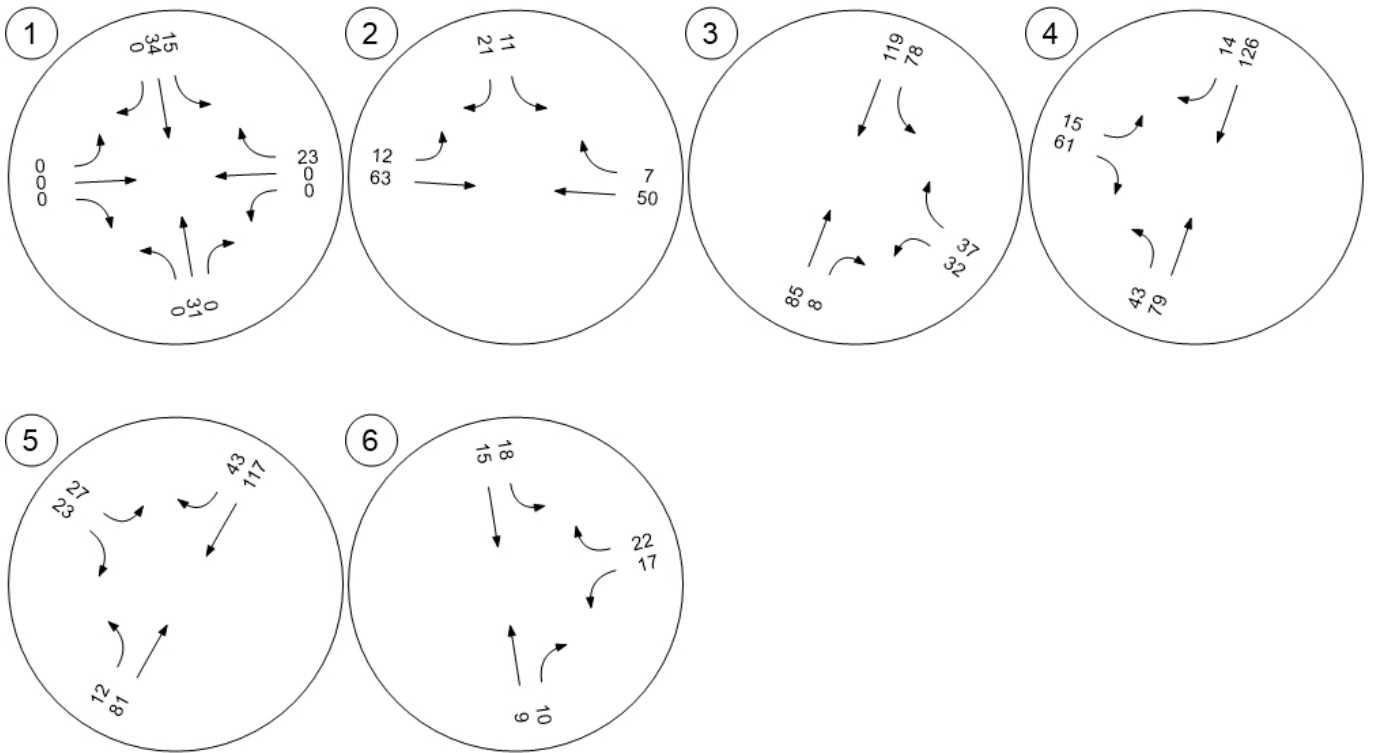
Annexure B

Traffic Volumes and Geometry

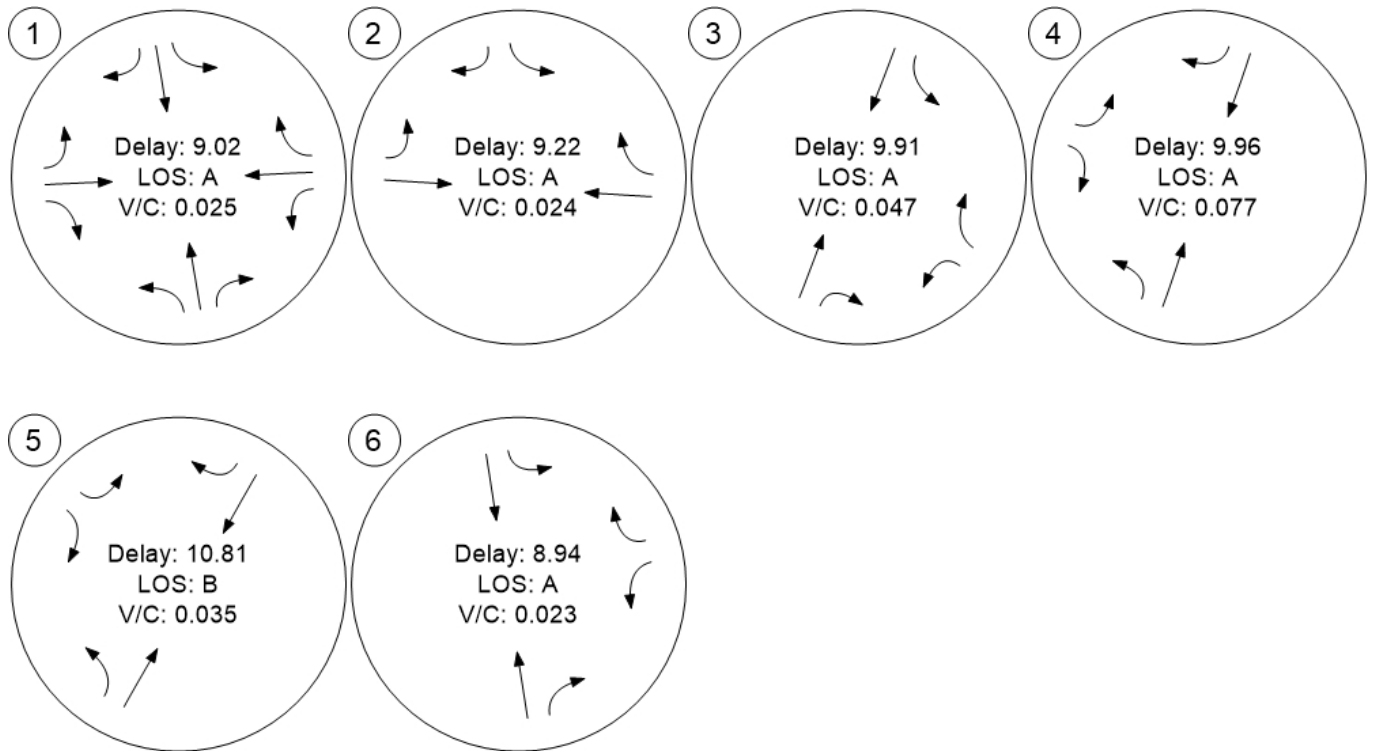
Lane Configuration and Traffic Control



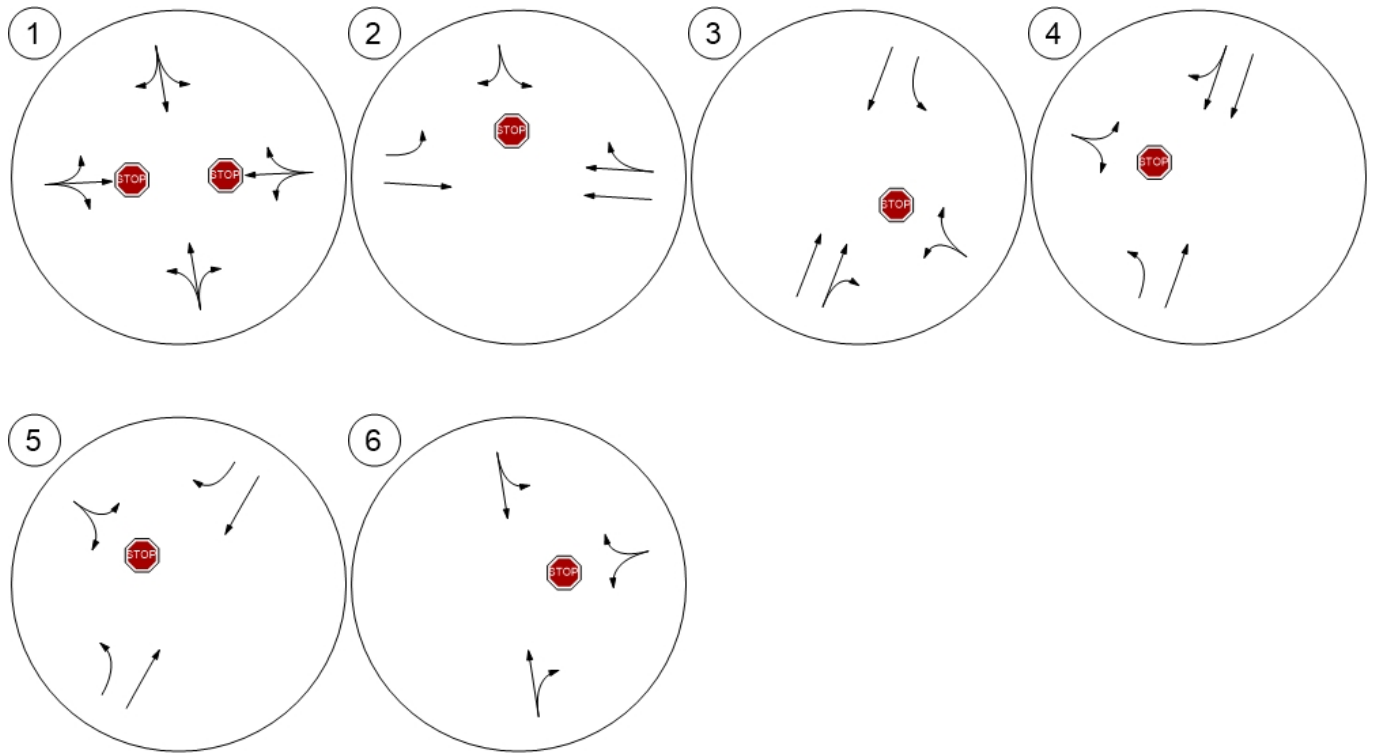
Traffic Volume - Future Total Volume



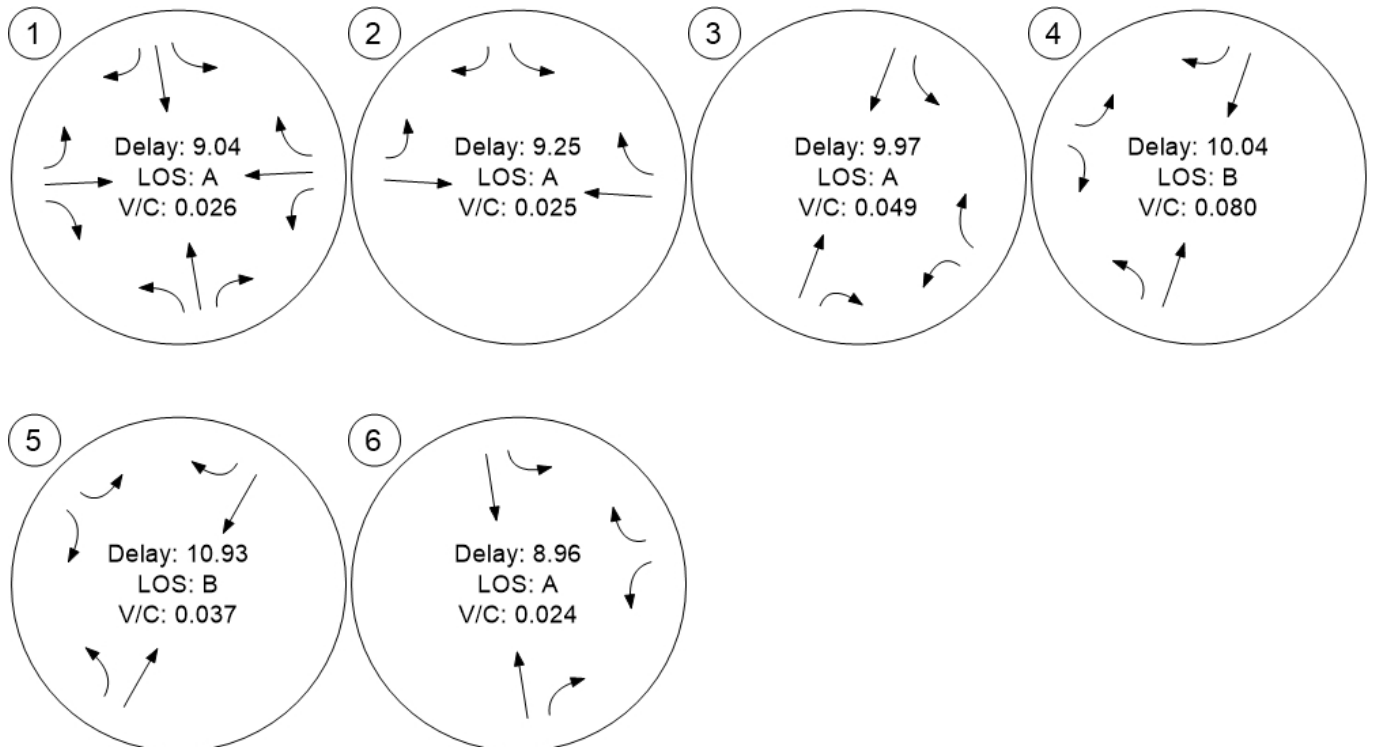
Traffic Conditions



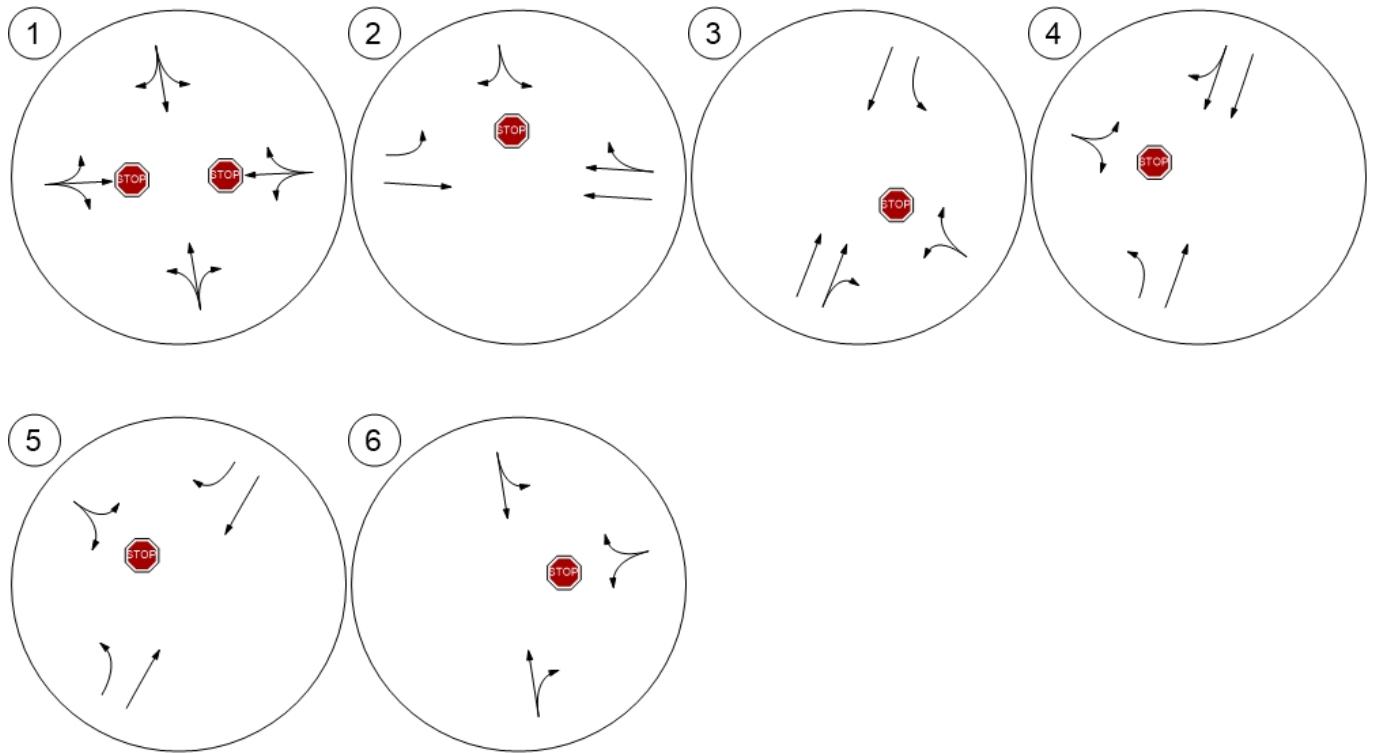
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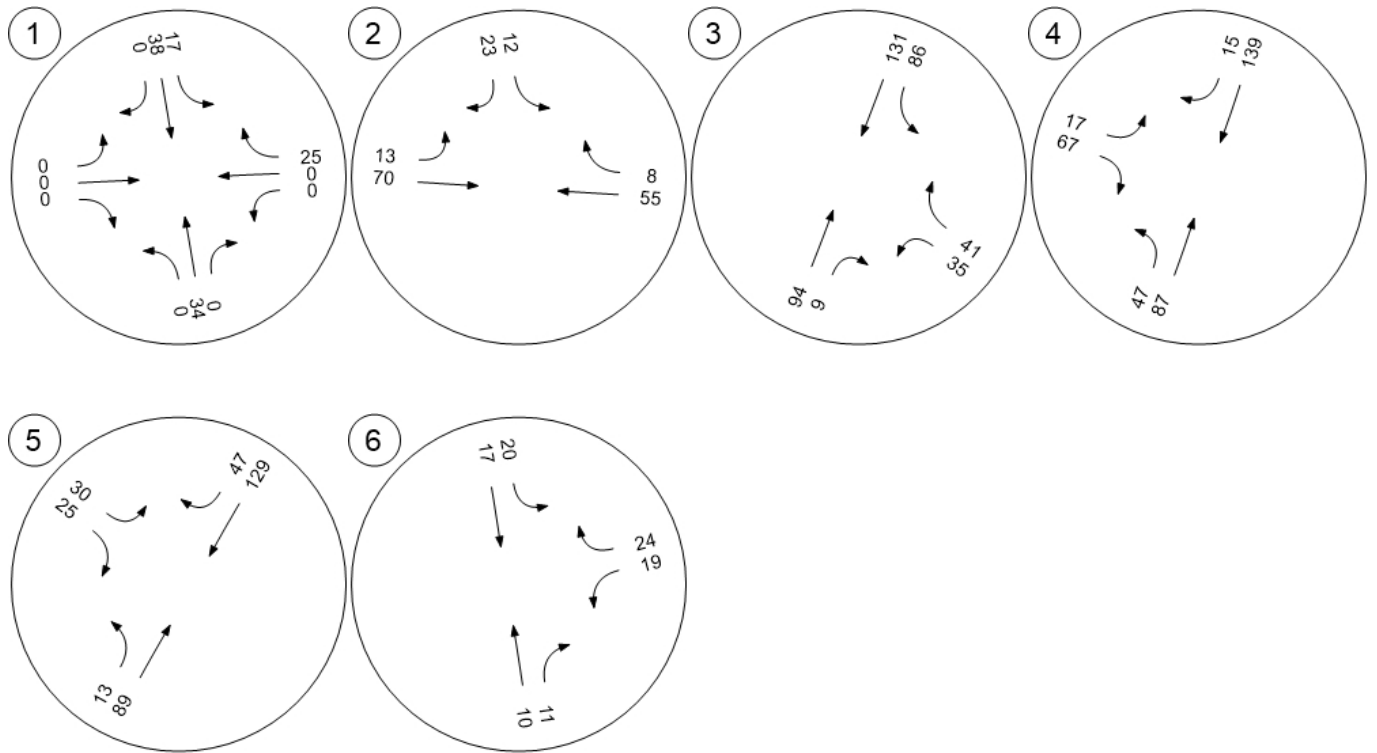
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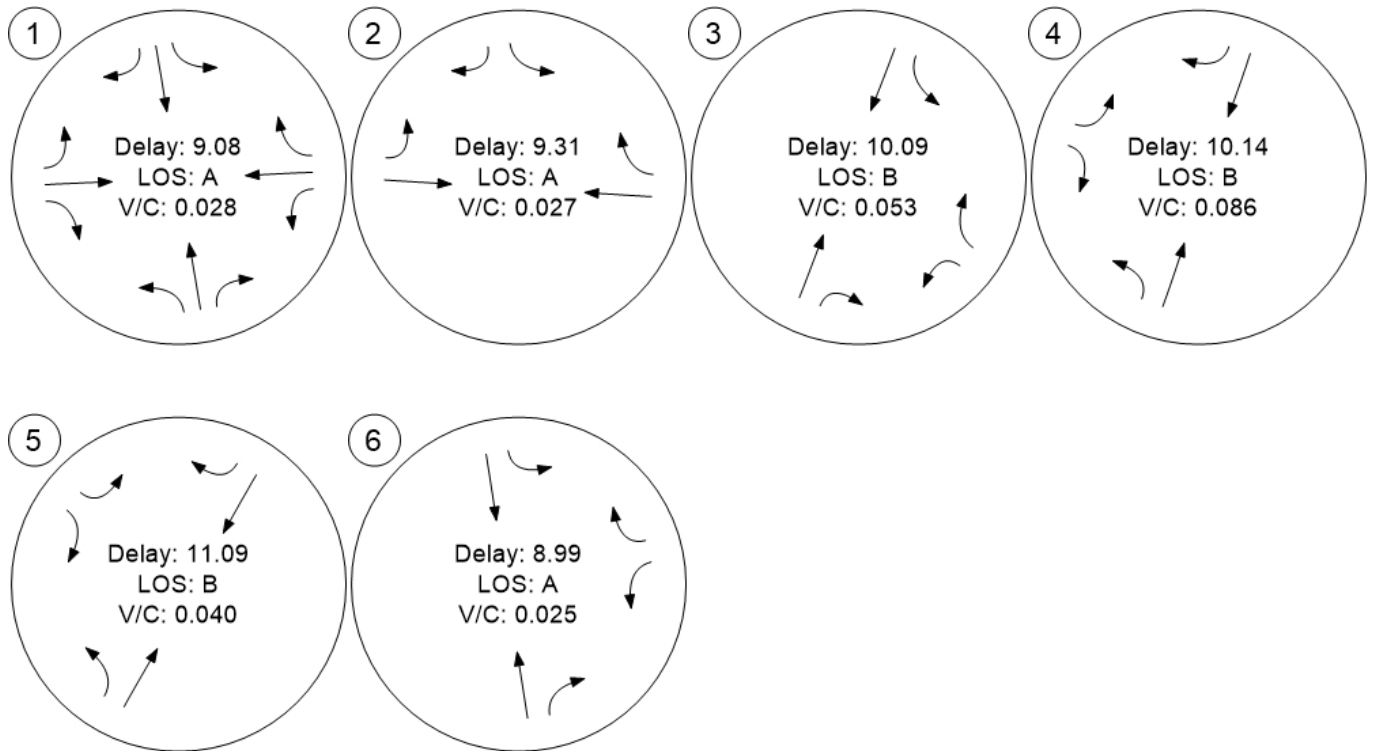
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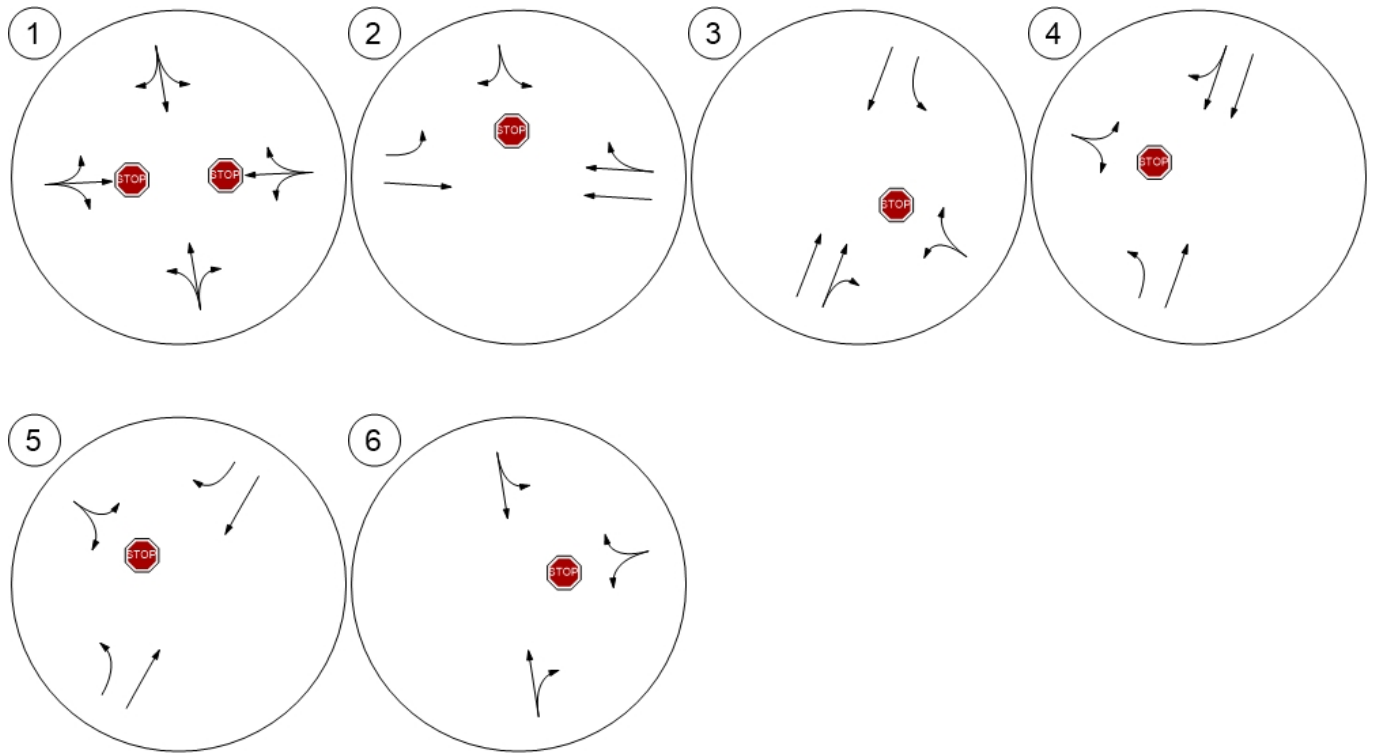
Traffic Volume - Future Total Volume



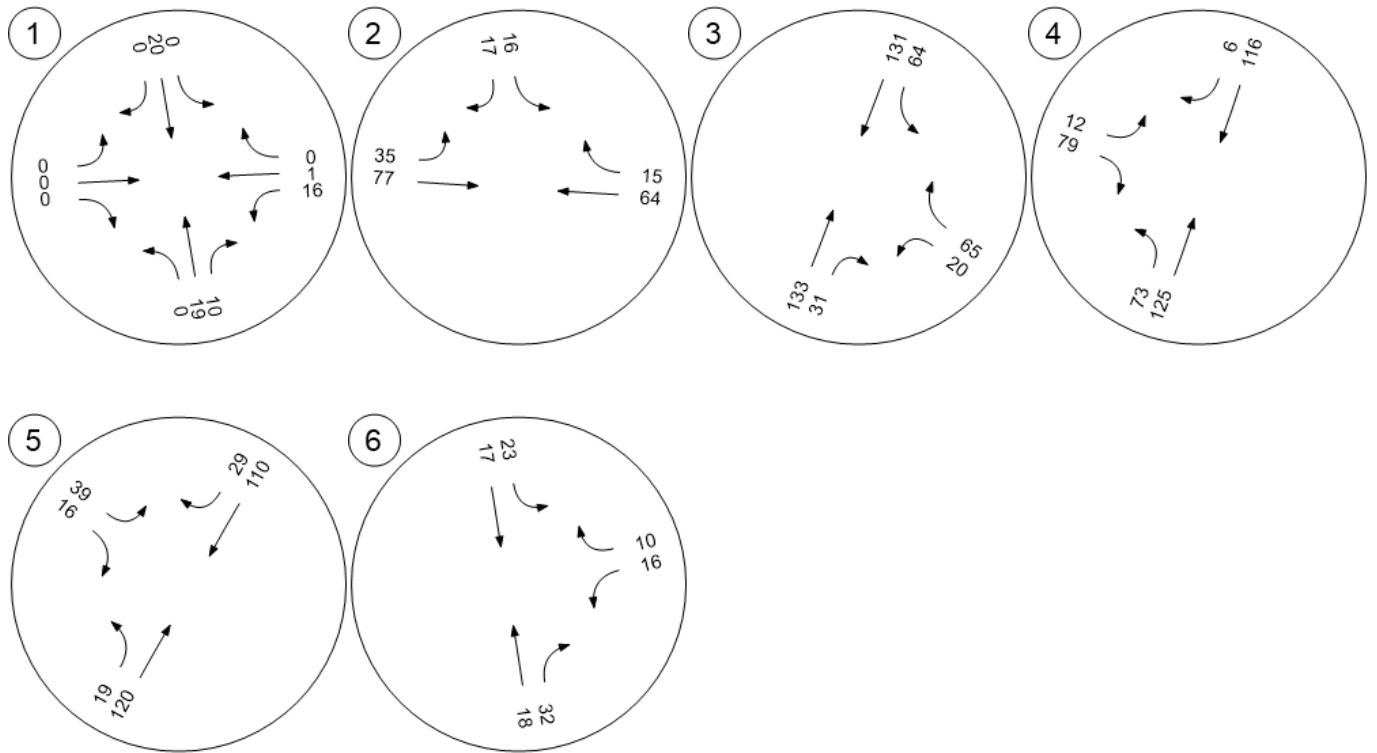
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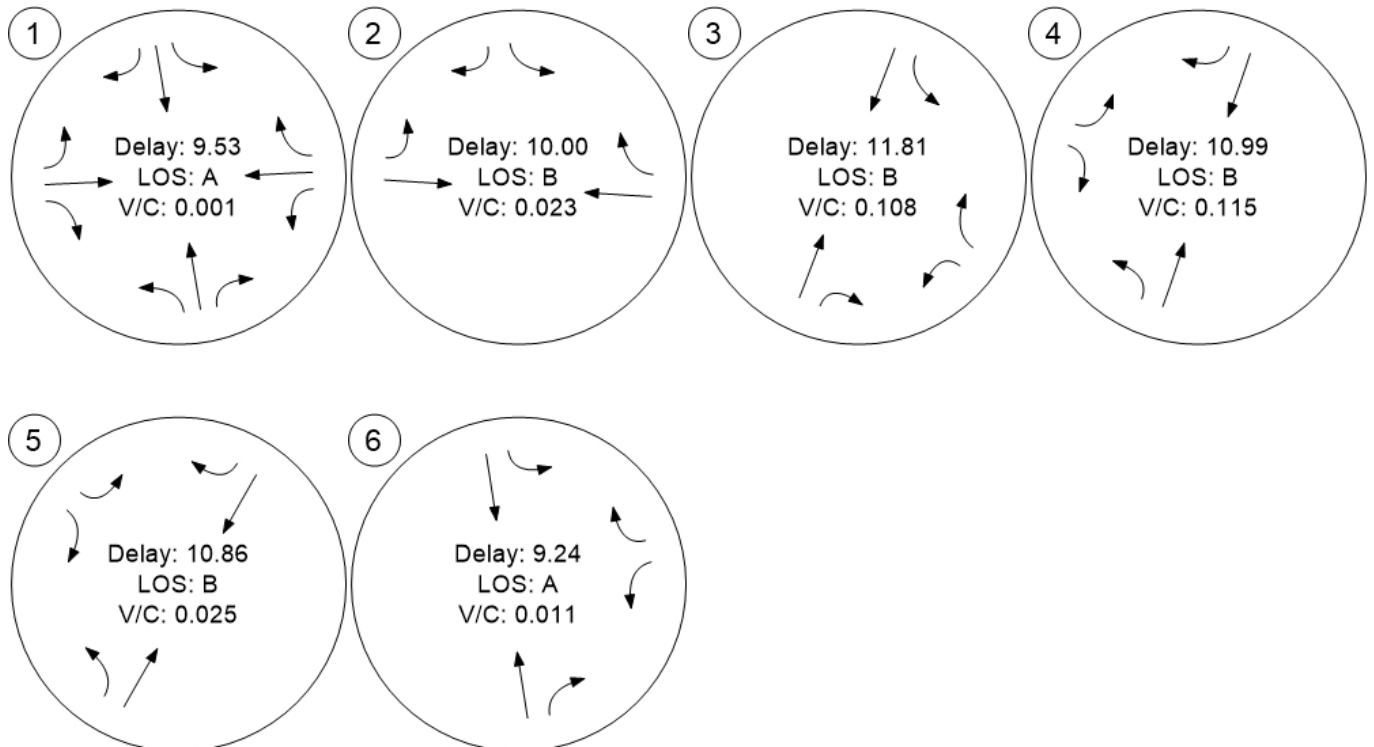
Lane Configuration and Traffic Control



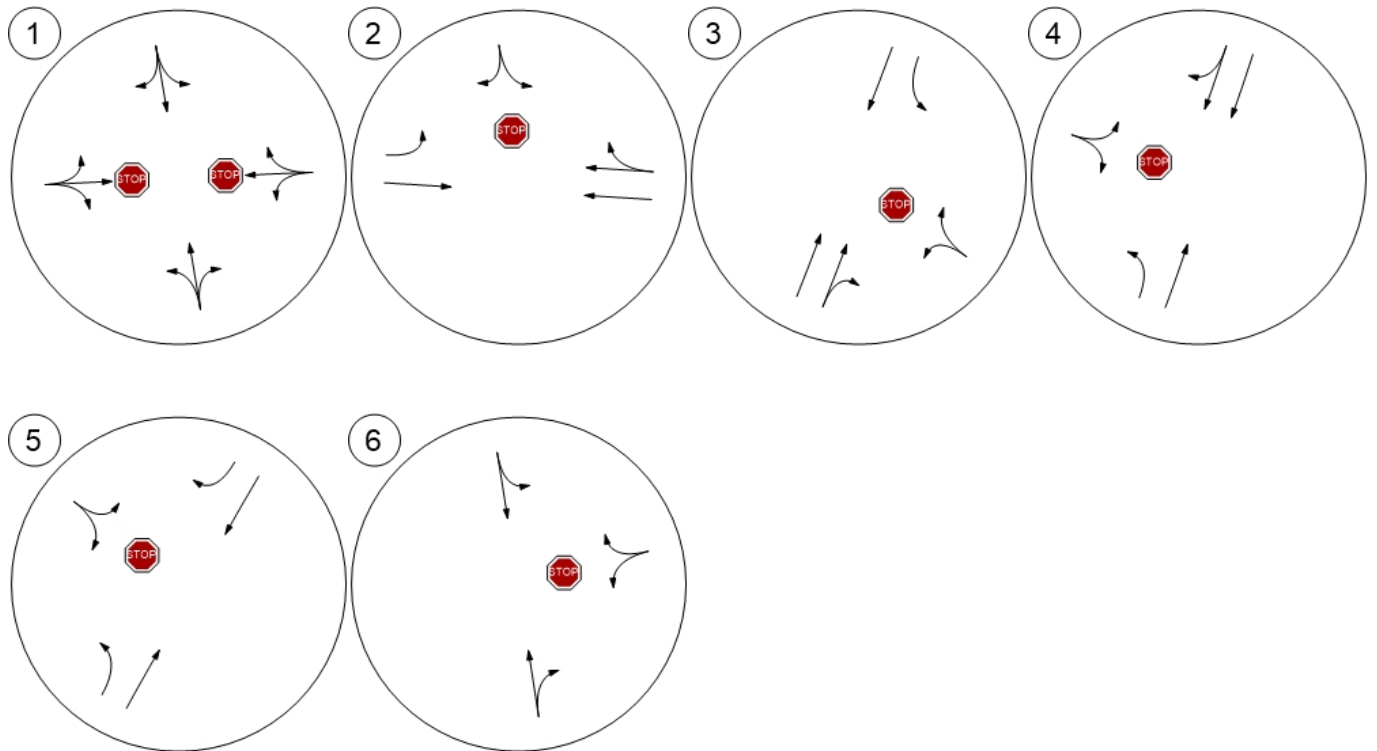
Traffic Volume - Future Total Volume



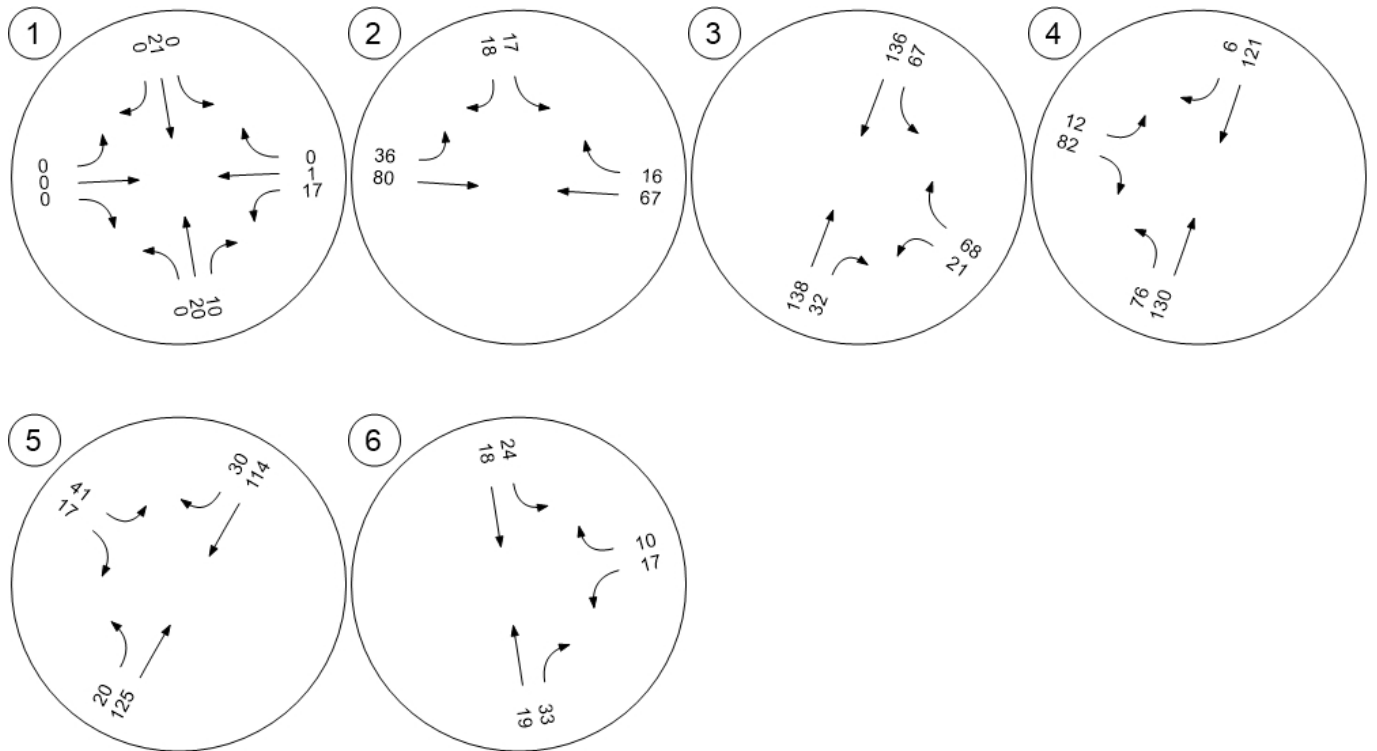
Traffic Conditions



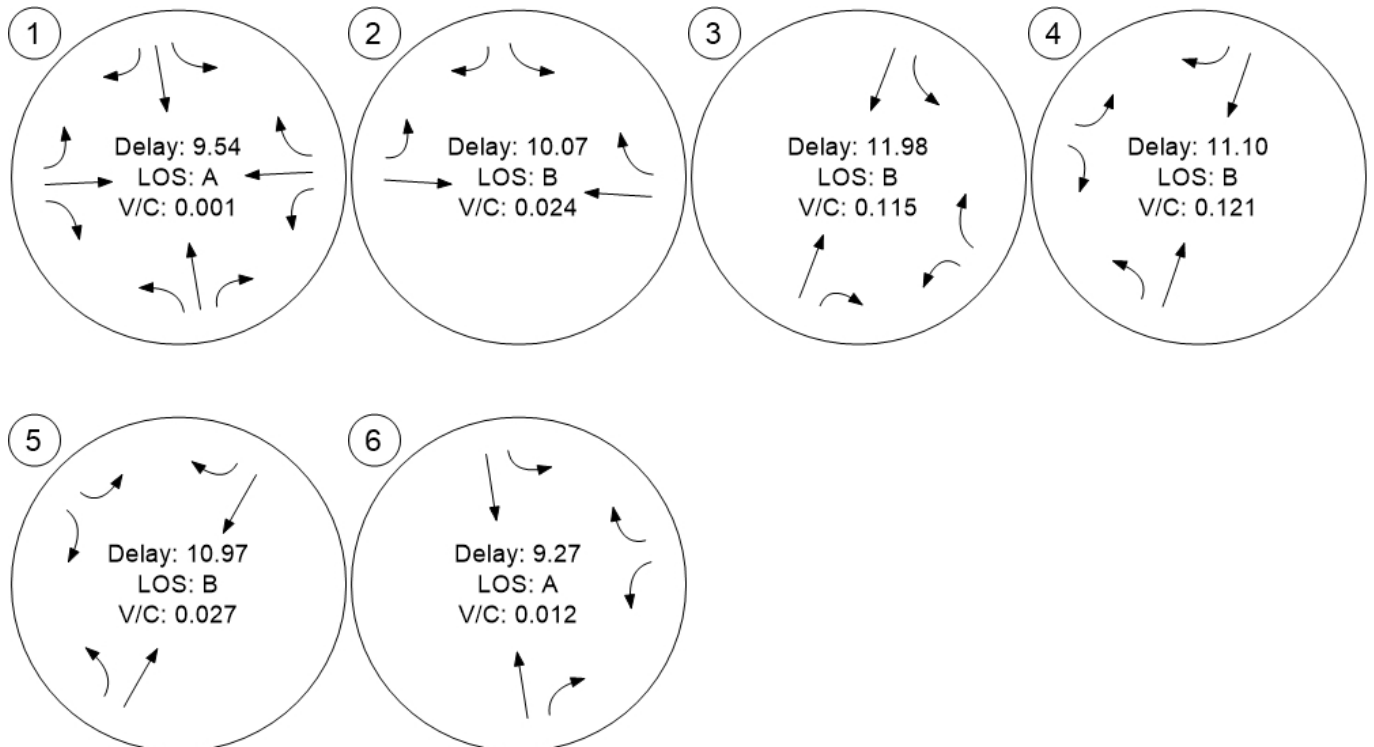
Lane Configuration and Traffic Control



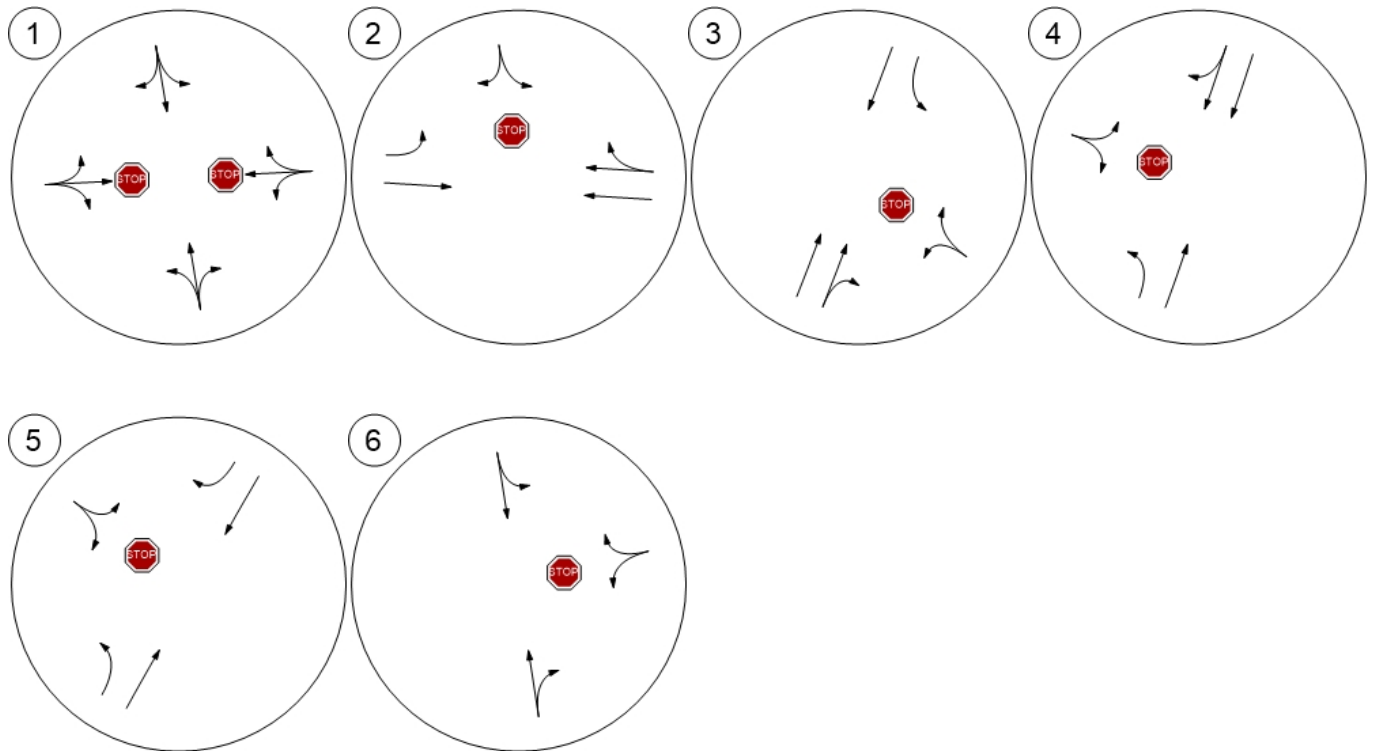
Traffic Volume - Future Total Volume



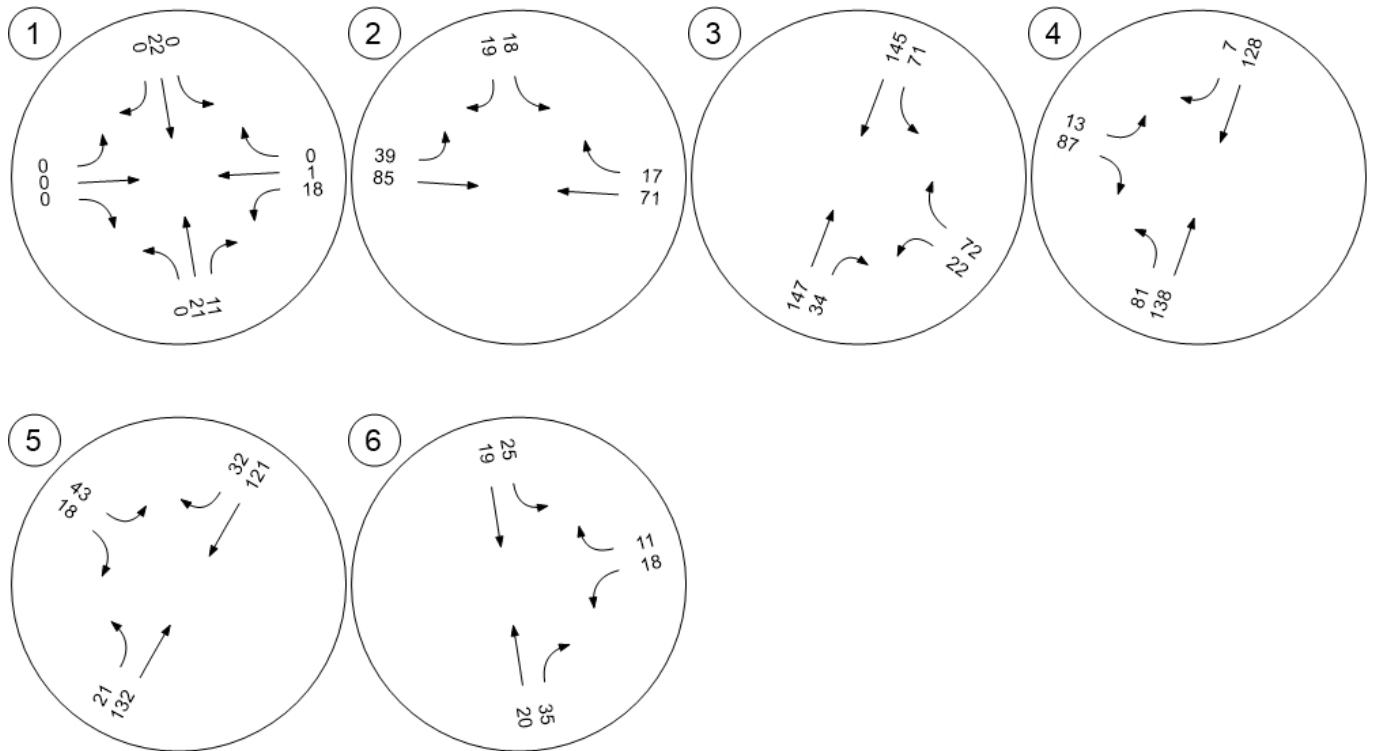
Traffic Conditions



Lane Configuration and Traffic Control



Traffic Volume - Future Total Volume



Traffic Conditions

