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Analysis of Operational Performance Levels of Urban Road Sections in Ambon City

(Case Study of Jl. Slamet Riyadi, Jl. Tulukabessy, Jl. Rijali, Jl. Kakialy and Jl. Diponegoro)

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Abstract: Urban road congestion in Ambon City is influenced by high traffic demand and intensive roadside activities, particularly along commercial corridors, which reduce effective road capacity and disrupt traffic flow. **Objective:** This study aims to evaluate the operational performance of selected urban road sections in Ambon City and identify critical corridors requiring priority traffic-management interventions. **Methodology:** An analytical–numerical approach based on the Indonesian Road Capacity Manual (MKJI 1997) was applied. Primary data were collected through field observations and traffic-volume counts at seven observation points along Jl. Slamet Riyadi, Jl. Tulukabessy, Jl. Rijali, Jl. Kakialy, and Jl. Diponegoro. Traffic flow (Q), road capacity (C), and degree of saturation (DS) were analyzed to determine operational performance. **Findings:** Jl. Slamet Riyadi (DS = 1.30), Jl. Tulukabessy (DS = 1.68), and Jl. Kakialy (DS = 1.09) operate at Level F, indicating forced-flow conditions where traffic demand exceeds practical capacity. In contrast, the three observation points on Jl. Rijali recorded DS values of 0.14–0.69, while Jl. Diponegoro recorded a DS of 0.61, indicating free-to-stable traffic conditions. **Implications:** Traffic-management interventions should prioritize Jl. Tulukabessy, Jl. Slamet Riyadi, and Jl. Kakialy through parking control, reduction of roadside friction, regulation of roadside access, and feasible geometric improvements. These findings can support local authorities in prioritizing traffic-management and infrastructure programs. **Originality:** This study integrates empirical traffic flow, capacity, and saturation measurements with localized traffic-conflict conditions across strategic urban corridors, extending MKJI 1997 from conventional capacity analysis into a practical framework for identifying and prioritizing critical urban road interventions.

Keywords: degree of saturation; road capacity; road performance; traffic flow; urban traffic

INTRODUCTION

Ambon City is one of the cities with a fairly high level of traffic congestion on several of its roads. Commercial areas along these roads frequently trigger traffic conflicts, which in turn cause congestion and irregularity along the road. The Indonesian Road Capacity Manual (MKJI 1997) defines a road section as a segment of road between two intersections that is not influenced by signalized or unsignalized intersections and that has almost the same characteristics along its length. For example, a cross-section of a road that is still affected by queues due to intersections, or by a high traffic flow of vehicles exiting signalized intersections, cannot be selected for the capacity analysis of a section. In addition, if there are fundamental changes in characteristics in terms of geometry, side obstacles, composition, or other factors, the segment must be treated as a different section; thus, the stretch between two intersections may in fact be defined as more than one section.

The research locations for this study are the road sections of Jl. Slamet Riyadi, Jl. Tulukabessy, Jl. Rijali, Jl. Kakialy, and Jl. Diponegoro in Ambon City. The problem on these road sections is congestion that occurs due to the high volume of traffic at certain times, such as in the morning, afternoon, and evening. Side obstacles also contribute to congestion because on-street parking is common due to the lack of dedicated parking space along the road, and the entry and exit of vehicles from several locations, such as offices and minimarkets (e.g., Indomaret), further disrupt traffic flow. Public transportation vehicles that frequently stop to pick up or drop off passengers also obstruct the smoothness of traffic flow.

In connection with the problems described above, it is necessary to evaluate the traffic volume, capacity, and performance level of the road sections and their side obstacles on Jl. Slamet Riyadi, Jl. Tulukabessy, Jl. Rijali, Jl. Kakialy, and Jl. Diponegoro, Ambon City. This study therefore aims to calculate and determine the operational performance level of these five road sections in Ambon City.

According to the Institute of Traffic Engineers, traffic engineering is a phase of transportation engineering that is closely related to the planning, geometric design, and operation of traffic, road networks, terminals, and adjacent areas, in relation to transportation modes, in order to produce safety, comfort, and efficiency in the movement of people and goods. LPM ITB emphasizes that traffic engineering is related to the technical design and layout of transportation infrastructure components such as roads, intersections, and vehicle parking areas.

According to the 1997 Indonesian Road Capacity Manual (MKJI), urban roads are road segments that have permanent and continuous development along the entire or almost the entire road, at least on one side of the road, whether in the form of land development or not. This includes roads in or near urban centers with a population of more than 100,000, as well as roads in areas with a population of less than 100,000 that have permanent and continuous side development.

Road Section Performance Analysis

Traffic Flow and Composition

In the 1997 MKJI manual, traffic flow (Q) values reflect traffic composition by expressing flow in passenger car units (pcu/smp). All traffic-flow values, per direction and in total, are converted into empirically derived pcu units for the following vehicle types: (1) passenger cars (pcu), using the passenger car equivalent for light vehicles (LV), which include passenger cars, minibuses, pick-ups, small trucks, and jeeps; (2) heavy vehicles (HV), which include trucks and buses; and (3) motorcycles (MC).

Table 1.1. Passenger Car Equivalent (emp) for Undivided Urban Roads [MKJI, 1997]

Road Type	Total Two-Way Flow (veh/hour)	emp HV	emp MC
Two lanes undivided (2/2 UD)	< 1800	1.3	0.5
Two lanes undivided (2/2 UD)	≥ 1800	1.2	0.35
Four lanes undivided (4/2 UD)	< 3700	1.3	0.4
Four lanes undivided (4/2 UD)	≥ 3700	1.2	0.25

Source: MKJI (1997).

Table 1.2. Passenger Car Equivalent (emp) for Divided and One-Way Urban Roads [MKJI, 1997]

Road Type	Flow per Lane (veh/hour)	emp HV	emp MC
Two-lane one-way (2/1) & four-lane divided (4/2 D)	< 1050	1.3	0.4
Two-lane one-way (2/1) & four-lane divided (4/2 D)	≥ 1050	1.2	0.25
Three-lane one-way (3/1) & six-lane divided (6/2 D)	< 1100	1.3	0.4
Three-lane one-way (3/1) & six-lane divided (6/2 D)	≥ 1100	1.2	0.25

Source: MKJI (1997).

The effect of non-motorized vehicles is accounted for separately, through the side-friction adjustment factor. The passenger car equivalent (emp) for each vehicle type depends on the road type and the total traffic flow, expressed in vehicles/hour.

Roadside Activities (Side Obstacles)

Roadside activities in Indonesia often create conflicts that can significantly impact traffic flow. Side obstacles that primarily affect the capacity and performance of urban roads include pedestrians, stopped and parked vehicles, motorized vehicles entering and leaving roadside areas, and slow-moving non-motorized vehicles. To simplify their treatment in the calculation procedure, side-friction levels are grouped into five classes as a function of the frequency of side-friction events along the observed road segment, as shown in Table 2.1.

Table 2.1. Side-Friction Classes for Urban Roads [MKJI, 1997]

Side-Friction Class (SFC)	Code	Weighted Frequency of Events (per 200 m/hour, two sides)	Typical Condition
Very Low	VL	< 100	Residential area with side streets
Low	L	100–299	Residential area with some public transport route
Medium	M	300–499	Industrial area with some shops on the roadside
High	H	500–899	Commercial area with high roadside activity
Very High	VH	> 900	Commercial area with market activity by the roadside

Source: MKJI (1997).

Free Flow Speed

Free flow speed (FV) is defined as the speed at a zero-flow level (FV = 0), i.e., the speed a driver would choose if driving a vehicle without being affected by other vehicles on the road. Free flow speed is determined through field observation, whereby the relationship between free flow speed and the geometric and environmental conditions of the road is established using a regression method. The free flow speed of light vehicles is used as the basic criterion of road-segment performance at zero flow. Free flow speed for heavy vehicles and motorcycles is provided as a reference; the free flow speed of passenger cars is generally 10–15% higher than that of other light vehicles.

The general equation for determining free flow speed is as follows (MKJI, 1997):

$$FV = (FVo + FVw) \times FFVsf \times FFVcs \quad ...(2.1)$$

where FV is the free flow speed of light vehicles under field conditions (km/h); FVo is the basic free flow speed of light vehicles on the road being observed (km/h); FVw is the adjustment for effective traffic-lane width (km/h); FFVsf is the adjustment factor for side obstacles; and FFVcs is the adjustment factor for city size.

Based on MKJI (1997), free flow speed is influenced by several factors, including the following.

1. Basic free flow speed, i.e., the free flow speed of light vehicles under ideal conditions for each road type, as shown in Table 3.1.

Table 3.1. Basic Free Flow Speed (FVo) for Urban Roads [MKJI, 1997]

Road Type	LV	HV	MC
Six lanes divided (6/2 D) or three lanes one-way (3/1)	61	52	48
Four lanes divided (4/2 D) or two lanes one-way (2/1)	57	50	47
Four lanes undivided (4/2 UD)	53	46	43
Two lanes undivided (2/2 UD)	44	40	40

Source: MKJI (1997). Values in km/hour.

2. Traffic-lane width, i.e., the width of the traffic lane excluding shoulders. The corresponding adjustment to free flow speed is shown in Table 3.2.

Table 3.2. Adjustment for the Effect of Traffic-Lane Width on Free Flow Speed of Light Vehicles [MKJI, 1997]

Road Type	Effective Traffic-Lane Width, Wc (m)	FVw (km/h)
Four-lane divided / one-way road (per lane)	3.00	-4
Four-lane divided / one-way road (per lane)	3.25	-2
Four-lane divided / one-way road (per lane)	3.50	0
Four-lane divided / one-way road (per lane)	3.75	2
Four-lane divided / one-way road (per lane)	4.00	4
Two undivided lanes (total)	5	-9.5
Two undivided lanes (total)	6	-3
Two undivided lanes (total)	7	0
Two undivided lanes (total)	8	3
Two undivided lanes (total)	9	4
Two undivided lanes (total)	10	6
Two undivided lanes (total)	11	7

Source: MKJI (1997).

3. Side friction, for which the free-flow-speed adjustment factor is shown in Table 3.3.

Table 3.3. Adjustment Factor for the Effect of Side Obstacles and Shoulder Width on Free Flow Speed of Light Vehicles for Urban Roads with Shoulders [MKJI, 1997]

Road Type	Side-Friction Class	Shoulder Width 0.5 m	Shoulder Width 1.0–1.5 m	Shoulder Width ≥ 2.0 m
Four-lane divided (4/2 D)	Very Low	1.02	1.03	1.04
Four-lane divided (4/2 D)	Low	0.98	1.01	1.03
Four-lane divided (4/2 D)	Medium	0.94	0.98	1.02
Four-lane divided (4/2 D)	High	0.89	0.93	0.98
Four-lane divided (4/2 D)	Very High	0.82	0.87	0.95

Two-lane undivided (2/2 UD) or one-way street	Very Low	1.00	1.01	1.01
Two-lane undivided (2/2 UD) or one-way street	Low	0.96	0.98	1.00
Two-lane undivided (2/2 UD) or one-way street	Medium	0.90	0.93	0.96
Two-lane undivided (2/2 UD) or one-way street	High	0.82	0.86	0.90
Two-lane undivided (2/2 UD) or one-way street	Very High	0.73	0.79	0.85

Source: MKJI (1997).

4. City size, i.e., the number of residents of a city, which also influences the free flow speed of light vehicles. The corresponding adjustment factor is shown in Table 3.4.

Table 3.4. Adjustment Factor (FFVcs) for the Effect of City Size on Urban Free Flow Speed [MKJI, 1997]

City Size (million inhabitants)	Adjustment Factor for City Size
< 0.1	0.90
0.1 – 0.5	0.93
0.5 – 1.0	0.95
1.0 – 3.0	1.00
> 3.0	1.03

Source: MKJI (1997).

Capacity

According to Hobbs (1995), capacity is a measure of performance under varying conditions, applicable to a particular location or to a very complex road network. Khisty and Lall (1990) define the capacity of a road section as the maximum number of vehicles that can reasonably pass through the section (in one or both directions) during a specific time period under general road and traffic conditions. Meanwhile, MKJI (1997) defines capacity as the maximum flow that can be maintained through a point on the road per hour under prevailing conditions.

For two-lane, two-way roads, capacity is determined for combined two-way traffic. For roads with multiple lanes, however, traffic is separated by direction and capacity is determined per lane. Values are derived, whenever possible, from field data collected under flow conditions approaching the capacity of the road segment; because such conditions are rarely observed directly in the field, capacity is also estimated from analysis of traffic-flow conditions and, theoretically, by assuming a mathematical relationship between density, speed, and flow. Capacity is expressed in passenger car units (pcu/smp).

The basic equation for determining capacity is as follows (MKJI, 1997):

$$C = Co \times FCw \times FCsp \times FCsf \times FCcs \quad \text{...(2.2)}$$

where C is capacity (pcu/hour); Co is the base capacity (pcu/hour); FCw is the lane-width adjustment factor; FCsp is the directional-separation adjustment factor (undivided roads only); FCsf is the side-obstacle and shoulder-width adjustment factor; and FCcs is the city-size adjustment factor. If actual field conditions match the baseline (ideal) conditions, all adjustment factors become 1.0 and capacity equals the base capacity.

Based on MKJI (1997), road capacity is influenced by several factors, including the following.

1. Basic capacity (Co), i.e., the capacity of the road section under ideal conditions for each road type, as shown in Table 4.1.

Table 4.1. Basic Capacity (Co) for Urban Roads [MKJI, 1997]

Road Type	Basic Capacity (smp/hour)	Notes
Four-lane undivided / one-way road	1650	Per lane
Four-lane undivided	1500	Per lane
Two-lane undivided	2900	Total, two-way

Source: MKJI (1997).

2. Lane and lane width, i.e., the part of the road specifically designed for vehicle movement, parking, or stopping. Road width is determined by the road type, as shown in Table 4.2.

Table 4.2. Capacity Adjustment for the Effect of Traffic-Lane Width on Urban Roads (FCw) [MKJI, 1997]

Road Type	Effective Traffic-Lane Width, Wc (m)	FCw
Four-lane undivided / one-way road (per lane)	3.00	0.92
Four-lane undivided / one-way road (per lane)	3.25	0.96
Four-lane undivided / one-way road (per lane)	3.50	1.00
Four-lane undivided / one-way road (per lane)	3.75	1.04
Four-lane undivided / one-way road (per lane)	4.00	1.08
Two-lane undivided (total, both directions)	5	0.56
Two-lane undivided (total, both directions)	6	0.87
Two-lane undivided (total, both directions)	7	1.00
Two-lane undivided (total, both directions)	8	1.14
Two-lane undivided (total, both directions)	9	1.25
Two-lane undivided (total, both directions)	10	1.29
Two-lane undivided (total, both directions)	11	1.34

Source: MKJI (1997).

3. Directional separation: for one-way or divided roads, the directional-separation adjustment factor does not apply and is taken as 1.0, whereas for undivided roads the factor is determined as shown in Table 4.3.

Table 4.3. Capacity Adjustment Factor for Directional Separation (FCsp) [MKJI, 1997]

Directional Split (%–%)	**50–50**	**55–45**	**60–40**	**65–35**	**70–30**
FCsp – two-lane road	1.00	0.97	0.94	0.91	0.88
FCsp – four-lane road	1.00	0.985	0.97	0.955	0.94

Source: MKJI (1997).

4. Side friction, for which the capacity adjustment factor is shown in Table 4.4.

Table 4.4. Adjustment Factor for the Effect of Side Obstacles and Shoulder Width on Urban Road Capacity with Shoulders (FCsf) [MKJI, 1997]

Road Type	**Side-Friction Class**	**Shoulder Width 0.5 m**	**Shoulder Width 1.0–1.5 m**	**Shoulder Width ≥ 2.0 m**
Four-lane divided (4/2 D)	Very Low	0.96	0.98	1.01
Four-lane divided (4/2 D)	Low	0.94	0.97	1.00
Four-lane divided (4/2 D)	Medium	0.92	0.95	0.98
Four-lane divided (4/2 D)	High	0.88	0.92	0.95
Four-lane divided (4/2 D)	Very High	0.84	0.88	0.92
Two-lane undivided (2/2 UD) or one-way street	Very Low	0.94	0.96	0.99
Two-lane undivided (2/2 UD) or one-way street	Low	0.92	0.94	0.97
Two-lane undivided (2/2 UD) or one-way street	Medium	0.87	0.91	0.94
Two-lane undivided (2/2 UD) or one-way street	High	0.80	0.86	0.90
Two-lane undivided (2/2 UD) or one-way street	Very High	0.70	0.79	0.85

Source: MKJI (1997).

5. City size, i.e., the number of residents of a city, which also affects road capacity. The corresponding adjustment factor is shown in Table 4.5.

Table 4.5. Adjustment Factor (FCcs) for the Effect of City Size on Road Capacity [MKJI, 1997]

City Size (million inhabitants)	**Adjustment Factor for City Size**
< 0.1	0.86
0.1 – 0.5	0.90
0.5 – 1.0	0.94
1.0 – 3.0	1.00
> 3.0	1.04

Source: MKJI (1997).

Degree of Saturation

MKJI (1997) defines the degree of saturation (DS) as the ratio of flow to capacity, used as the primary factor in determining the performance level of intersections and road segments. The DS value indicates whether a road section still has sufficient capacity or not. The degree of saturation is calculated using the following equation:

$$DS = Q / C \quad ...(2.3)$$

where Q and C are, respectively, traffic flow and capacity expressed in pcu/hour. DS is subsequently used for traffic-behavior analysis, expressed in terms of speed.

This study aims to evaluate the performance level of roads are as follows:

1. Analyze the operational performance levels of urban road sections in Ambon City by identifying traffic flow characteristics, congestion patterns, and capacity utilization.
2. Evaluate the effectiveness of current road infrastructure and management practices in meeting urban mobility demands and minimizing delays.
3. Develop performance indicators and measurement frameworks that capture the urgency and seriousness of road-related operational issues.
4. Optimize strategies for improving road section performance through scenario-based recommendations, including traffic management, infrastructure upgrades, and policy interventions.
5. Validate the proposed frameworks and strategies by applying them to selected case studies of road sections in Ambon City, ensuring reliability and practical applicability for urban transport planning.

This research contributes to the advancement of traffic engineering and urban transport planning by applying the Indonesian Road Capacity Manual (MKJI 1997) to systematically evaluate the operational performance of critical urban road sections in Ambon City. The technical novelty lies in the integration of empirical saturation degree (DS), traffic flow (Q), and capacity (C) measurements with localized traffic conflict analysis in commercial corridors, which are often overlooked in conventional capacity studies.

The study is expected to contribute by:

- Improving efficiency: Providing a performance-based framework that identifies oversaturated road sections (DS > 1.0) and prioritizes interventions to reduce congestion.
- Enhancing accuracy: Validating MKJI 1997 calculations with real survey data (April 11, 2023), ensuring that performance assessments reflect actual traffic conditions in Ambon City.

- Strengthening reliability: Establishing a replicable methodology for evaluating urban road sections that can be applied to other Indonesian cities with similar congestion challenges.
- Advancing stability in traffic management: Offering optimization strategies (e.g., intersection redesign, traffic signal adjustments, corridor management) that stabilize traffic flow in high-conflict commercial areas.
- Positioning within engineering practice: Extending the practical utility of MKJI 1997 beyond design calculations, transforming it into a diagnostic and decision-support tool for urban road performance evaluation.

Hypothesis

If the MKJI 1997 framework is applied to evaluate and optimize road sections in Ambon City, then:

- Congestion-prone corridors (e.g., Slamet Riyadi, Tulukabessy, Kakialy) can be identified with higher precision,
- Targeted interventions can be developed to reduce DS values below critical thresholds.

RESEARCH METHOD

The unit of analysis is the operational performance of selected urban road sections in Ambon City, modeled as traffic flow domains evaluated using MKJI 1997 parameters. The research design is analytical–numerical, using MKJI 1997 as the structural model, survey data as inputs, and traffic flow parameters as outputs to evaluate the operational performance of urban road sections.

The data sources in this research are as follows:

1. Primary Data (Experimental Measurements / Field Survey)
    - Traffic Volume Counts (Q): Collected through direct observation and manual counting of vehicles on April 07, 2026, at selected road segments (Slamet Riyadi, Tulukabessy, Rijali, Kakialy, Diponegoro).
    - Road Capacity (C): Determined using parameters from the Indonesian Road Capacity Manual (MKJI 1997), adjusted to local road conditions.

- Degree of Saturation (DS): Calculated from field data using the formula DS=QC.

2. Secondary Data (Validated Reference)
   - MKJI 1997 (Indonesian Road Capacity Manual): Used as the standardized analytical framework for capacity estimation, performance evaluation, and traffic flow modeling.
   - Urban Road Characteristics: Road geometry, lane configuration, and land-use context (commercial corridors) referenced from municipal planning documents and validated against field observations.

The data collection methods used in this study are observation techniques, recording techniques, and literature (library) techniques. The data analysis method used in this study is the Indonesian Road Capacity Manual (MKJI 1997) method.

RESULT

The highest traffic volume (Q), capacity (C), and degree of saturation (DS) obtained for each of the seven observed road sections, based on the survey conducted on Tuesday, 07 April 2026, are summarized in Table 1.

Table 1. Recapitulation of Traffic Volume, Capacity, and Degree of Saturation

No	Road Section	Q (smp/hour)	C (smp/hour)	DS	Level	Remarks
1	Jl. Slamet Riyadi	2573.4	1973	1.30	F	Forced flow, no longer effective
2	Jl. Tulukabessy	4990.3	2975	1.68	F	Forced flow, no longer effective
3	Jl. Rijali (in front of the Lion Alley)	1905.45	2760	0.69	B	Stable flow, still effective
4	Jl. Rijali (in front of the DPR)	1654.6	2760	0.60	B	Stable flow, still effective
5	Jl. Kakialy	2689.5	2457	1.09	F	Forced flow, no longer effective
6	Jl. Rijali (in front of Indomaret)	373.4	2760	0.14	A	Free flow, still effective
7	Jl. Diponegoro	3121.8	5136	0.61	B	Stable flow, still effective

Source: Field survey and calculation results, 2023.

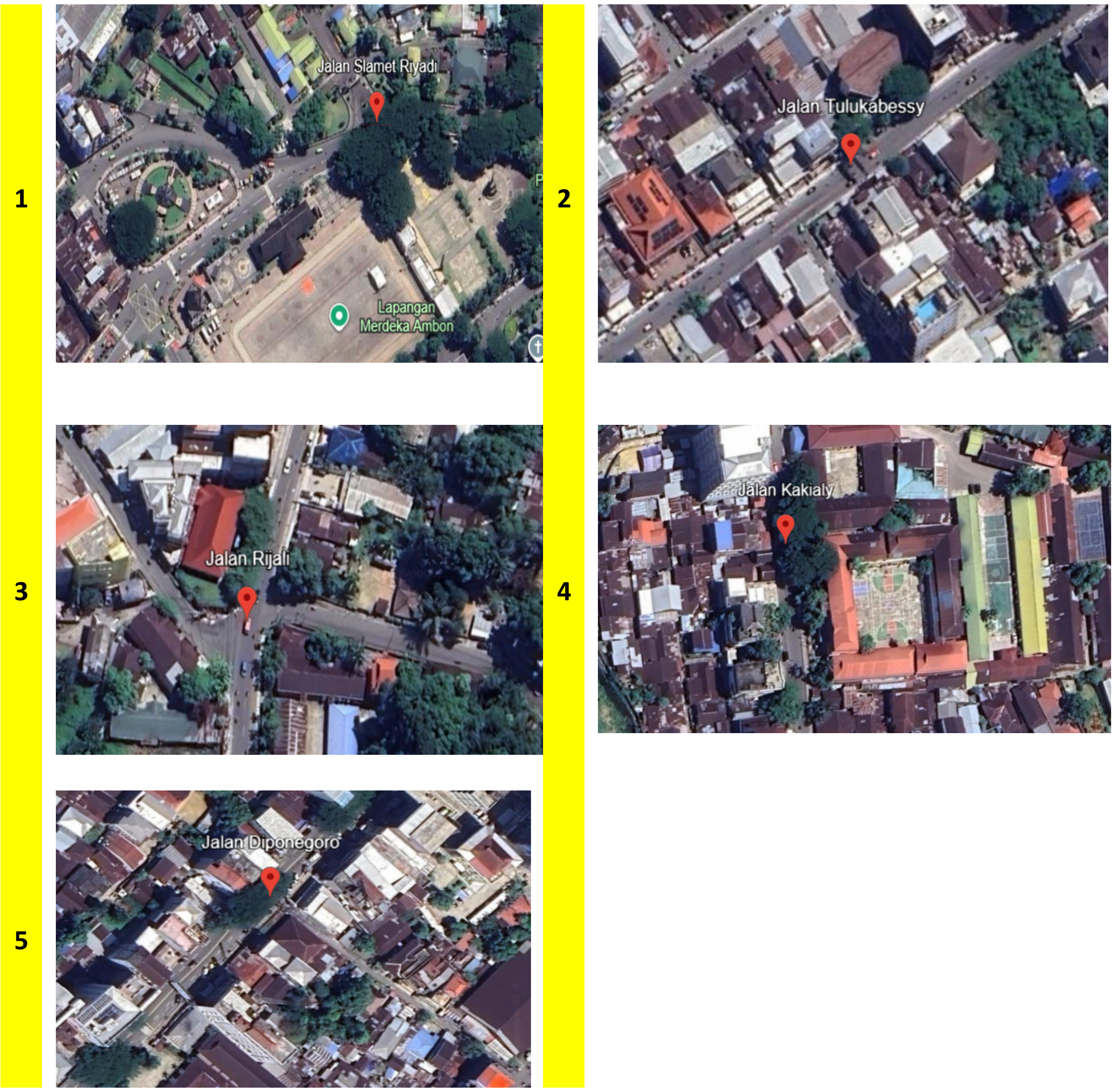

Figure 2. Aerial view of the research location (Jl. Slamet Riyadi[1], Jl. Tulukabessy[2], Jl. Rijali[3], Jl. Kakialy[4], and Jl. Diponegoro[5], Ambon City).

1. Road Sections with Degree of Saturation Above 1.0

Table 1 shows that three of the seven observed sections — Jl. Slamet Riyadi (DS = 1.30), Jl. Tulukabessy (DS = 1.68), and Jl. Kakialy (DS = 1.09) — have a degree of saturation greater than 1.0, placing them at performance Level F according to the MKJI (1997) classification. A DS value above 1.0 indicates that the traffic flow passing through the section already exceeds its practical capacity, so that the road can no longer accommodate the existing traffic volume without forced flow, queuing, and a significant drop in travel speed. Jl. Tulukabessy shows the most severe condition among the three, with a DS of 1.68, meaning the traffic demand is more than one and a half times the available capacity. Field observation indicates that this condition is closely related to intensive roadside commercial activity, on-street parking, and vehicles entering and leaving shops directly from the carriageway, all of which reduce the effective capacity through the side-friction correction factor (FCsf).

2. Road Sections with Degree of Saturation Below 0.75

The remaining four observation points — Jl. Rijali in front of the Lion Alley (DS = 0.69), Jl. Rijali in front of the DPR (DS = 0.60), Jl. Rijali in front of Indomaret (DS = 0.14), and Jl. Diponegoro (DS = 0.61) — fall within performance Levels A and B, indicating stable to free-flow traffic conditions. Jl. Diponegoro, despite carrying the second-highest traffic volume among all sections (3121.8 smp/hour), still records a comparatively low DS of 0.61 because of its larger capacity (5136 smp/hour), reflecting a wider carriageway and comparatively lower side friction along the corridor. Jl. Rijali in front of Indomaret shows the lowest DS of all observed points (0.14), indicating substantial reserve capacity at that particular location.

DISCUSSION

Overall, the results indicate that road capacity alone does not determine operational performance; the interaction between traffic volume and side friction plays an equally important role. Sections passing through dense commercial frontage Jl. Slamet Riyadi, Jl. Tulukabessy, and Jl. Kakialy are the most critical, as they combine high traffic volume with high side friction, both of which push the degree of saturation beyond the practical capacity threshold. In contrast, Jl. Rijali and Jl. Diponegoro, which have comparatively wider carriageways and lower roadside activity, remain within an acceptable performance range despite carrying substantial traffic volumes. These findings suggest that improvement priority should be given to Jl. Tulukabessy, Jl. Slamet Riyadi, and Jl. Kakialy, through measures such as parking restriction, control of roadside trading activity, or geometric widening where feasible, rather than through capacity expansion alone.

CONCLUSION

Based on the survey and calculation carried out on Tuesday, 07 April 2026 using the Indonesian Highway Capacity Manual (MKJI 1997), it can be concluded that Jl. Slamet Riyadi (DS = 1.30), Jl. Tulukabessy (DS = 1.68), and Jl. Kakialy (DS = 1.09) are no longer effective in accommodating the current traffic volume, since their degree of saturation exceeds 1.0 and places them at performance Level F.

Meanwhile, Jl. Rijali (DS between 0.14 and 0.69 at its three observation points) and Jl. Diponegoro (DS = 0.61) are still effective, as their degree of saturation remains below the critical threshold and corresponds to performance Levels A and B.

It is recommended that traffic management measures including parking restriction, control of side friction from roadside commercial activity, and, where geometrically feasible, carriageway widening be prioritized on Jl. Tulukabessy, Jl. Slamet Riyadi, and Jl. Kakialy. Periodic monitoring of traffic performance on Jl. Rijali and Jl. Diponegoro is also recommended, given the continuing growth of vehicle ownership and commercial activity in Ambon City.

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NOMENCLATURE

FV	The meaning for free flow speed
FV = 0	The meaning for a zero-flow level
FVo	The meaning for free flow speed of light
FVw	The meaning for effective traffic-lane width

FFVsf	The meaning for side obstacles
FFVcs	The meaning for city size
C	The meaning for capacity
Co	The meaning for base capacity
FCw	The meaning for the lane-width
FCsp	The meaning for the directional-separation
FCsf	The meaning for the side-obstacle and shoulder-width
FCcs	The meaning for the city-size adjustment
Q	The meaning for volume
DS	The meaning for obtained for each of the seven observed road sections