Measuring the Traffic Impacts of Tactical Urbanism: A Corridor and Intersection Analysis in Quezon City

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Abstract: Tactical Urbanism emerges as a practical approach for implementing low-cost, short-term interventions to experiment for possible improvements on urban planning, transportation, and economics. However, limited research has been focused on studying the changes in traffic behavior during and after implementation of tactical urbanism. This paper aims to provide empirical evidence on the changes in traffic behavior in Maginhawa Street, Quezon City in terms of traffic volume count through unsignalized intersection analysis and midblock analysis, and travel time and delay. Results indicate that the reduced traffic volume may have been displaced to adjacent and nearby roads, and reductions in delay post-intervention point to improved traffic flow conditions after reversion to two-way traffic. The findings contribute to the growing body of knowledge on tactical urbanism by showing data-driven insights that may be used as a guide for future traffic assessments on tactical urbanism.

Keywords: *Tactical Urbanism, Intersection Analysis, Midblock Analysis, Travel Time and Delay*

1. INTRODUCTION

Urban streets in rapidly growing cities like Quezon City are under pressure to accommodate a wide variety of road users, including private vehicles, public transport, active mobility users, and pedestrians. within limited space. Tactical Urbanism (TU), characterized by low-cost and temporary changes to street design, has gained traction globally as a flexible approach to reclaim space for non-motorized users, enhance livability, and improve safety (Lydon & Garcia, 2015; Sunio & Mateo-Babiano, 2022). These interventions are typically implemented with the aim of calming traffic, improving multimodal accessibility, and providing immediate feedback for longer-term urban design improvements.

In the Philippines, the SPARK (Sparking Active Mobility Actions for Climate-Friendly Cities) Project represents one of the first institutionalized attempts to pilot TU strategies in a dense urban setting. Implemented in 2024 along a 230-meter section of Maginhawa Street in Quezon City, the project included a temporary one-way scheme, curb extensions, parklets, and painted pedestrian zones. These interventions were later removed, enabling researchers to evaluate traffic conditions before, during, and after the TU implementation.

The interventions were selected to particularly influence traffic performance indicators such as changes in traffic volume, travel speed, and travel time. Table 1 summarizes these impacts per TU intervention, while Figure 1 shows pictures of each intervention stated.

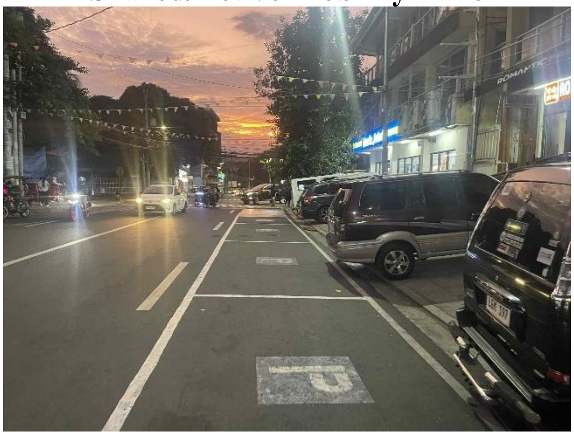
Table 1. TU Interventions, their intended impacts, and impact area

Tactical Urbanism Intervention	Intended Impact on Mobility	Main Indicator	Impact Coverage
Conversion to one-way traffic	Decrease in passenger car volume	Volume Count, Travel Time	Network
Traffic Calming Measures			
Shared Lane (Pedestrians, Cyclists, PWDs)	Reduced vehicle speeds, increase in pedestrian count and bicycle volume	Travel Time, Delays, Speed	Local
Parklets, Regulated Parking, Parking Bays	Reduced passenger car speeds near pedestrian activities	Delays	Local
Painted Surfaces	Increase in pedestrian count, decrease in passenger car volume	Volume Count	Local
Spaces for Al Fresco Dining, Plant Buffers	Trigger driver caution near pedestrians	Delays	Local

Map of One-way Traffic Scheme

Shared/Active Mobility Lane

Parklet fronting TVE Barangay Hall



On-road Parking Slots

Figure 1. Photos of tactical urbanism interventions implemented along Maginhawa St., section from Magiting St. to Masinsinan St. (1 of 2)

Painted Surfaces

Space for Al Fresco Dining, Plant Buffers, Bike Rack

Figure 1. Photos of tactical urbanism interventions implemented along Maginhawa St., section from Magiting St. to Masinsinan St. (2 of 2)

While TU interventions are often assessed through walkability audits and public perception surveys, there remains a limited body of empirical studies that examine their effects on vehicular performance using standard traffic engineering metrics such as travel time, delay, and Level of Service (LOS) (Pozzoni et al., 2023; Liu et al., 2021). This study addresses that gap by measuring traffic performance not only along the primary corridor (Maginhawa St.), but also along adjacent streets (Magiting and Masinsinan) that may have absorbed displaced traffic.

The study specifically aims to:

1. Determine the Level of Service (LOS) of traffic movements at the bounding unsignalized intersections and of midblock sections, through intersection and midblock analyses.
2. Measure the effects of tactical urbanism on travel time and delay along Maginhawa, Magiting, and Masinsinan Streets during AM and PM peak hours across three implementation phases.

1.1 Scope and Limitations

Data collection for this study was conducted during the Pre-Intervention, Interim (Post-Interim Intervention), and Post-Intervention phases, spanning from November 2024 to March 2025 along Maginhawa Street in Diliman, Quezon City. The study focused on traffic volume counts and travel time and delay surveys, using Traffic Impact Assessment (TIA) methods to evaluate both intersection and midblock performance. The study area covered the segment of Maginhawa St. between the Maginhawa–Magiting and Maginhawa–Masinsinan intersections.

Although prior research emphasizes the importance of including adjacent streets to capture broader network-level impacts, this study was constrained to the defined segment due to budget limitations. As such, only Magiting St. and Masinsinan St. was considered for this analysis since these streets will have the immediate impacts of the said interventions. Expanding the scope to cover a wider road network would have provided a more comprehensive understanding of how the interventions influenced overall traffic dynamics in the surrounding area. To partially address this limitation, intersection analyses at Magiting Street and Masinsinan Street were conducted to assess potential redistribution effects.

While a comprehensive assessment of the broader impacts of tactical urbanism would provide a deeper understanding of the interactions among various transportation factors along Maginhawa Street, the scope of this paper is limited to evaluating vehicular performance. Although concurrent surveys—such as spot speed measurements, pedestrian counts, and road safety audits—were undertaken alongside the volume counts and the travel time and delay studies, the present analysis is confined to examining the effects of tactical urbanism interventions on vehicular conditions.

Regarding the temporal scope of data collection, the study focused on the 9:30 AM to 10:30 AM period during weekends, corresponding to the late morning peak. This time window was selected based on observed increases in traffic volume during this period, particularly along Maginhawa Street, where weekend travel is often driven by recreational and commercial activities. This consideration aligns with similar findings in other urban areas where weekend peak hours tend to occur later in the morning.

2. REVIEW OF RELATED LITERATURE

2.1 Tactical Urbanism and Urban Street Reconfiguration

Tactical urbanism (TU) refers to a citizen-led or community-driven approach to reclaiming public space through short-term, low-cost, and scalable interventions designed to demonstrate long-term change (Tactical Urbanist's Guide, 2025). These projects typically use temporary materials such as paint, planters, bollards, and barricades to introduce design elements like parklets, pop-up bike lanes, and pedestrian zones (Urban Design Lab, 2023). TU strategies are often used to test new street configurations, promote walkability, and enhance pedestrian safety.

TU interventions offer several benefits. They are highly flexible and involve minimal financial investment, with many materials donated or installed by volunteers. More importantly, TU facilitates user engagement by creating real-world prototypes of reimagined street space. However, TU initiatives also face operational challenges. Commercial stakeholders sometimes resist due to fears of reduced customer traffic, while motorists may be inconvenienced by re-routing or loss of vehicle space (Urban Design Lab, 2023).

2.2 Global Examples of Tactical Urbanism

Notable TU interventions worldwide illustrate the potential of street reallocation. In the United States, San Francisco launched its parklet program in 2005, while New York City's "Pavement to Plazas" initiative in 2007 converted road segments into vibrant public spaces (Lydon & Garcia, 2015; Sadik-Khan & Solomonow, 2016). Other interventions include street closures for children's play (Cowman, 2017; Zieff et al., 2014) and expanded sidewalks for outdoor dining and vending (Combs & Pardo, 2021).

TU has also been adopted in the Global South. The Institute for Transportation and Development Policy (ITDP, 2020) presents case studies from cities like São Paulo, Jakarta, Chennai, and Cairo. These examples show how tactical changes can transition from pilots to permanent solutions, often after overcoming resistance through data collection and stakeholder engagement. Key success factors include strong political will, inclusive planning processes, and demonstrable benefits such as speed reduction and safety improvements.

2.3 Evaluating Tactical Urbanism Interventions

While early TU assessments focused on user satisfaction, aesthetics, and place-making, a growing number of studies have begun to examine operational outcomes. Pozzoni et al. (2023) used TomTom floating car data to analyze changes in travel time and Level of Service (LOS) across pre- and post-intervention periods, including adjacent streets to account for redistribution effects. Liu et al. (2021) used VISSIM simulation to assess impacts of road diets and one-way schemes on network delay, throughput, and intersection performance.

Recognizing the need for more structured assessment frameworks, the Tactical Urbanism Guidebook by GIZ and MoHUA (2020) proposes grouping performance indicators into three categories:

1. Mobility indicators – travel time, delay, traffic speed, LOS
2. Safety indicators – vehicle-pedestrian interactions, conflict points, sight distances
3. Livability indicators – space reallocation, user satisfaction, mode shift trends

Studies using traffic engineering metrics such as delay, volume-to-capacity ratio (v/c), and intersection control delay offer a more objective evaluation of TU effects (Liu et al., 2021; Pozzoni et al., 2023). These metrics align with methodologies found in the Highway Capacity Manual (HCM) and are commonly supported by field-based data, including volume counts and travel time surveys.

2.4 Midblock and Intersection Analysis

Operational impacts of TU also manifest in intersections and midblock segments. The HCM defines LOS for midblock segments using v/c ratio, travel speed, or delay per vehicle, while unsignalized intersections are evaluated through control delay and reserve capacity.

In the Philippine context, Sigua (2008) presents localized procedures for estimating capacity and LOS, using gap-acceptance theory for unsignalized intersections. Key parameters include critical gap and follow-up time, which define the ability of minor movements to safely enter or cross the major road. LOS classifications range from A (free flow) to F (oversaturation), enabling planners to assess the stability and quality of flow.

Deshpande et al. (2006) and Caldeira et al. (2019) further support LOS-based evaluations for temporary road reconfigurations. Caldeira's work in Jakarta demonstrates how simple, low-cost data collection such as video analytics and turning movement counts can be used to study traffic conditions in Global South cities.

Intersection and midblock analyses provide a more granular view of TU impacts, capturing localized congestion, turning movement efficiency, and spillover effects. When combined with route-level travel time data, they enable a comprehensive understanding of how tactical interventions affect traffic operations across a corridor.

2.5 Travel Time, Delay, and Traffic Flow Metrics

Travel time and delay are key indicators of traffic performance. The floating car method is widely accepted for estimating these metrics in real-world conditions, especially in low- and middle-income countries. It enables calculation of average speed and delay per segment, which can be compared across phases or designs.

Delay, defined as the time lost compared to free-flow conditions, is affected by geometry, volume, and traffic control devices. These indicators are particularly important in assessing TU, which often reallocates space and reduces lane width or capacity. When used with time-of-day segmentation, such as peak-hour surveys, these metrics yield insights into congestion dynamics and operational efficiency.

In the context of TU, slower speeds may be desirable in high-pedestrian zones, while delays and LOS help determine if these benefits come at excessive costs to mobility.

3. METHODOLOGY

3.1 Study Context

The focus area of this paper is a section of Maginhawa St., Quezon City, from Maginhawa – Magiting Intersection to Maginhawa – Masinsinan Intersection, as shown in Figure 2. Maginhawa Street is a four-lane local road, while Magiting St. and Masinsinan St. are two-lane local roads. Though Magiting St. and Masinsinan St. are narrower in terms of lane width and number of lanes, they serve as an alternative route for vehicles when interventions are applied to Maginhawa St., in this case, a conversion from two-way to one-way scheme.

Figure 2. Study Area – Maginhawa Street

3.4 Data Gathering Procedure

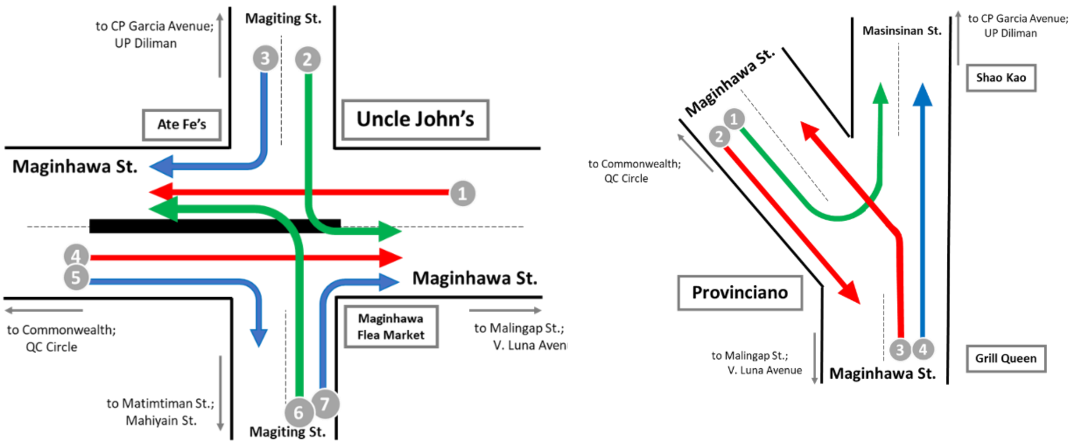
3.4.1 Traffic Volume Count Survey

Traffic volume is the most basic of all traffic parameters. The purpose of the traffic volume count surveys is to determine the number and type of vehicles and their movements per hour especially during the peak morning and afternoon hours of traffic especially at intersections.

A 16-hour classified traffic volume counts at 15-minute intervals was conducted at two intersections as shown in Figure 3. For the baseline data, the pre-intervention survey was conducted on Sunday, November 24, 2024 (weekend) and Wednesday, November 27, 2024 (weekday). Interim post survey was conducted on Sunday, January 26, 2025 (weekend) and Tuesday, January 28, 2025 (weekend). The post-intervention survey was conducted on Sunday, March 23, 2025 (weekend), and Thursday, March 27, 2025 (weekday).

Figure 3. Traffic Count Survey Stations

The traffic movements for each survey station are shown in Figure 4. Note that in Station 1, it is prohibited to turn left (movement 2) from the north side of Magiting St. to Maginhawa St. but a significant number of vehicles were observed taking this traffic movement.



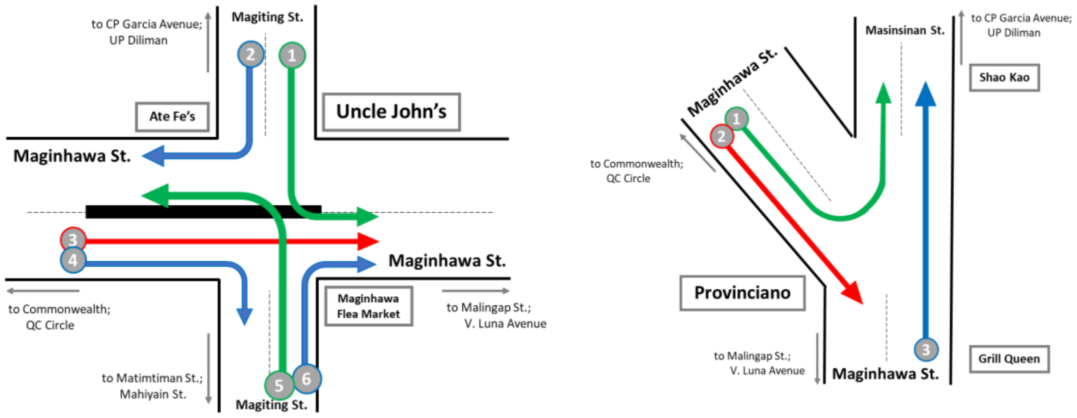
Station 1 Station 2

Figure 4. Traffic Movements per Station (before the installation of interventions)

Traffic count surveyors shall be employed to count the number of vehicles according to vehicle type and direction of movement (straight-through, right-turn, left-turn). For the study's purposes, the survey will classify traffic into the following 8 vehicle types:

1) private passenger vehicles/ taxis/ UV Express;
2) jeepneys;
3) buses;
4) medium trucks;
5) large trucks;
6) tricycles;
7) motorcycles; and,
8) bicycles (including e-bikes.

For the interim-post intervention phase, the following movements are removed: Movement 1 at Station 1 and Movement 3 at Station 2, as shown in Figure 5. This change is due to the implementation of one-way scheme at Maginhawa Street at this phase.



Station 1 Station 2

Figure 5. Traffic Movements per Station (during the Interim Post)

3.4.2 Travel Time and Delay Survey

Travel time refers to the total duration a vehicle takes to travel over a specific section of roadway. At the same time, delay represents the time lost due to traffic friction and control devices. From the travel time data, the average vehicle speed can be calculated, allowing for the identification of problem locations based on delays.

The survey employed the "test car technique." In this method, a test vehicle was driven along the study route as shown in Figure 6, with the driver maintaining a speed that reflects the average traffic flow.

Figure 6. Study route for travel time and delay survey

The survey captured travel time and delay samples during both peak and off-peak hours, as shown in Table 2. A total of six runs were conducted for each peak and off-peak hour during the three survey periods. The number of runs was set to six, as this represents the maximum feasible number that can be completed within a one-hour interval.

Table 2. Travel Time and Delay Survey schedule

Survey Period	Weekend	Weekday	Peak Hours	Off-Peak Hours
Pre	November 24, 2024	November 27, 2024	7-8am	9:30-10:30am
Interim Post	January 26, 2025	January 28, 2025	12nn-1pm	2:30-3:30pm
Post	March 23, 2025	March 27, 2025	5-6pm	9-10pm

In this survey, the study aimed to find a less labor-intensive method for conducting the process on-site, with the goal of minimizing repeated runs and saving fuel. The data collection process was divided into two phases: fieldwork and desk work, as shown in the flowchart below in Figure 7.

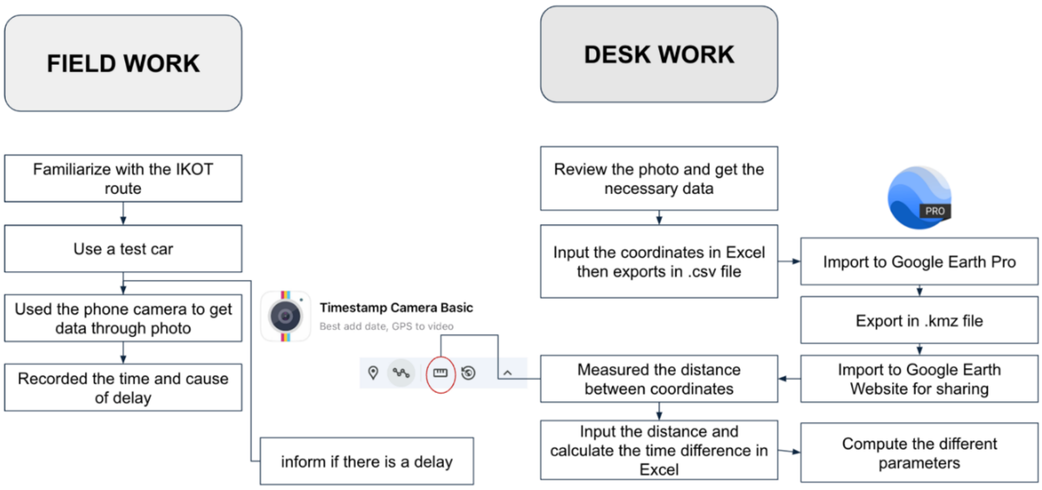


Figure 7. Flow chart for TTDS data collection process

During the survey, the Timestamp Camera application was utilized to record the time and location of each delay. The Timestamp Camera application records real-time GPS locations, including latitude and longitude.

To ensure consistency of travel time measurements across the three survey periods, several reliability measures were implemented. Only two drivers were engaged for the floating-car surveys—one primary and one reliever—to minimize variation in driving behavior; both were instructed to maintain steady, typical speeds. The same surveyors were deployed throughout the study to avoid observer-related inconsistencies. All runs followed the same route, including the same U-turn slots, and were conducted during identical time windows across all periods. External disruptions such as heavy rain, road works, or special events were avoided, and the same data-recording method was applied for all runs. These checks help ensure that observed changes in travel time and delay reflect actual operational conditions rather than inconsistencies in data collection.

After completing six runs, desk work followed to manually encode the location, time, and cause of delay. The coordinates (latitude and longitude) were exported to a **.csv** file and imported into Google Earth Pro, which automatically plotted the points. To optimize time, the plotted coordinates were saved as a new project and exported as a **.kmz** file, allowing access via the Google Earth application in a browser. The distances were measured using Google Earth's available measurement tool, and the results were recorded. The elapsed time for both running and delays was computed using Excel. From this data, the total trip length, total travel time, total running time, travel speed, running speed, mean travel speed, and mean running speed were calculated.

3.5 Data Assessment Procedure

3.5.1 Midblock Analysis

For the midblock analysis, the traffic volume count data are divided into volumes per section, combining the two-way minor street movements (Magiting St. Northbound and Southbound) as one segment. The peak hour volumes for both AM and PM Peak Hours were assessed and were then converted into their passenger unit car (PCU) values using the values in Table 3.

Table 3. Passenger Car Unit (PCU) Values

Vehicle Type	PCU
Passenger Cars	1.00
Jeepneys	1.50
Buses	2.20
Medium Trucks	2.00
Large Trucks	2.50
Tricycles	1.00
Motorcycles	0.25
Bicycles/ E-Bikes	0.10

After conversion, the capacity per road section was calculated, then the Volume-Capacity Ratio was calculated after. Using the volume-capacity ratio, the level of service (LOS) was calculated, and interpreted using the corresponding levels of service in Table 4.

Table 4. Volume-Capacity Ratio and corresponding Levels of Service

Level of Service (LOS)	Volume - Capacity Ratio (VCR)	Description
A	less than 0.20	free flow traffic
B	0.21 - 0.50	free flow traffic
C	0.51 - 0.70	moderate traffic
D	0.71 - 0.85	moderate/ heavy traffic
E	0.86 - 1.00	heavy traffic
F	greater than 1.0	forced flow, stop and go

3.5.2 Unsignalized Intersection Analysis

For unsignalized intersections, the analysis focuses on minor traffic movements where drivers must yield to conflicting flows from the major road. The approach follows gap-acceptance theory, which assumes that a driver on the minor road will only proceed when a sufficient gap in the major road traffic is available.

The evaluation sequence of minor movements adheres to the standard priority hierarchy:

1. Right turns into major road
2. Left turns off the major road
3. Traffic crossing the road
4. Left turns into the major road

In this study, Maginhawa St. is classified as the major road, while Magiting St. (Station 1) and Masinsinan St. (Station 2) serve as minor approaches. Minor traffic movements and their corresponding movement numbers are summarized in Table 5.

Table 5. Summary of Existing Minor Traffic Movements

Station	Minor Traffic Movement	Movement No.	Description
Station 1	Right turn into major road	M3, M7	Right turn from Magiting St. to Maginhawa St.
	Left turn into major road	M2, M6	Left turn from Magiting St. to Maginhawa St.
Station 2	Left turn off major road	M1	Left turn from Maginhawa St. to Masinsinan St.

The geometric configuration of Maginhawa Street is as follows:

- Pre-Intervention / Post-Intervention: 4-lane two-way roadway
- Interim Post-Intervention: 2-lane one-way roadway
- Speed limit: 30 kph
- Traffic control: YIELD sign at minor approaches

Critical gap values for each movement are based on Sigua's recommended estimates for Philippine conditions and adjusted according to intervention phase (see Table 6). These values are essential inputs to estimate the basic capacity of minor movements using the graph shown in Figure 8.

Table 6. Critical Gaps for Passenger Cars

Minor Traffic Movement	Critical Value	
	Pre/Post	Interim Post
Right turn into major road	5.0	5.0
Left turn off major road	5.5	5.0
Traffic crossing major road	6.5	6.0
Left turn into major road	7.0	6.5

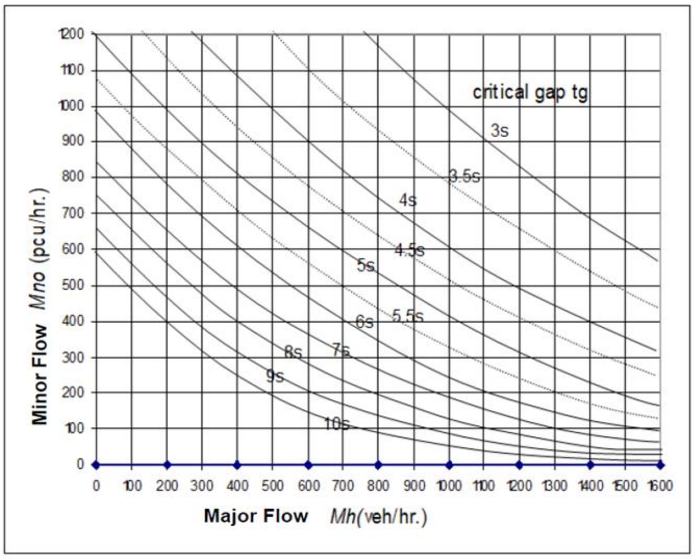


Figure 8. Basic capacity of minor road flow.
Source: Sigua, R. G. (2008) Fundamentals of Traffic Engineering. The University of the Philippines Press.

After computing the reserve capacity (difference between movement capacity and actual volume in passenger car units), the Level of Service is determined using the thresholds from Sigua (2008) in Table 7:

Table 7. Reserve Capacity

Reserve Capacity (pcu/hr)	Description	Level of Service (LOS)
> 600	Free flow, no traffic delay	A
251 – 600	Stable flow, very short traffic delay	B
176 – 250	Stable flow, short traffic delay	C
126 – 175	Approaching unstable flow, average traffic delay	C to D
76 – 125	Long traffic delay	D
0 – 75	Unstable flow, very long traffic delay	E
< 0	Forced flow, congestion	F

The output of the analysis consists of the LOS values for each minor traffic movement, allowing for comparison across all study phases: pre-intervention, interim post-intervention, and post-intervention.

4. RESULTS AND DISCUSSION

4.1 Analysis of 16-Hour Throughput Volume

Considering the total 16-hour throughput volumes in the two study intersections, the following data were collected and summarized in Table 8. It is evident that the total traffic volume in Station 1 (Maginhawa-Magiting Intersection) was greater than the traffic volume in Station 2 (Maginhawa-Masinsinan Intersection). This is largely because Station 1 is a four-legged intersection and initially allowing for two-way road movements, while Station 2 is a three-legged intersection, with Masinsinan St. only allowing for one-way movements.

Table 8. Total Throughput Volume at Maginhawa St. across all phases

Station/ Day	Total 16-Hour Volume				
	Pre-Intervention	Interim-Post Intervention	Post-Intervention	% Change (Pre vs Interim)	% Change (Pre vs Post)
Station 1					
Weekday	38,178	35,454	34,551	-7.13%	-9.50%
Weekend	24,259	22,944	22,431	-5.42%	-7.54%
% Decrease	**36.46%**	**35.29%**	**35.08%**		
Station 2					
Weekday	30,247	32,709	30,013	8.14%	-0.77%
Weekend	19,938	22,732	21,960	14.01%	10.14%
% Decrease	**34.08%**	**30.50%**	**26.83%**		

Comparing the difference between the volume count during weekdays vs the weekends, there is a consistent decrease in the traffic volume across all phases on both stations, amounting to 26 to 37% in decrease as compared to the traffic volume during the weekdays. It can be observed though, that while the % decrease in the traffic volume count at Station 1 is almost equal across the three intervention phases at 35-36%, the decrease at Station 2 is narrowing through the intervention phases. This may suggest that aside from the increase in traffic volume during the interim-post and post-intervention phases at Station 2, there is also an observable narrowing of the gap between the traffic volumes during the weekday and the weekend.

At Maginhawa St. – Magiting St. intersection (Station 1), there is a considerable amount of decrease for the total traffic volume due to the tactical urbanism interventions. Analyzing the changes between Pre-Intervention and Interim-Post Intervention at Station 1, there is a 5-7% decrease in traffic volume on weekdays and weekends. Interestingly, the decrease in traffic volume has been larger when comparing the Pre-Intervention to Post-Intervention, wherein a 8-10% decrease in traffic was observed. At face value, this should constitute to a positive impact of tactical urbanism to Maginhawa St. – Magiting St. Intersection. However, at Station 2, the opposite has been observed. At both weekday and weekend observations, the traffic volume was seen to increase in the Interim-Post Intervention from the baseline Pre-Intervention Data. During the weekday, approximately an 8% increase in the total traffic volume was observed. In the weekend, the increase was larger, accounting for a 14% increase in the traffic volume. These increases are toned down when comparing the Pre-Intervention Phase versus the Post-Intervention Phase, wherein a slight decrease in traffic volume was observed during the weekday, amounting to around 0.77%. For the weekend, the volume has still increased in the Post-Intervention Phase as compared to the Pre-Intervention Phase by 10%. However, this change is less than the increase from Pre- to Post-Interim.

4.2 Determination of Peak Hour

In determining the AM and PM Peak Hours in the study area, the following graphs were produced from the gathered data. During the Weekday Survey in the Pre-Intervention Phase a Station 1, it is evident that the peak hour of the day is at 7:00 AM to 8:00 AM, as shown in Figure 9. This volume constitutes 3,830 vehicles in total, accounting for 10.03% of the total volume count in the 16-hour duration. In the afternoon, it is observed that the peak hour is at 17:00 to 18:00 (5:00 PM to 6:00 PM), with a volume of 2,707 vehicles accounting for 7.09% of the total traffic volume at station 1. It is also evident in the data that private vehicles make up a large portion of the total traffic volume. Of all vehicles passing station 1, approximately 31.90% and 41.96% are comprised of motorcycles and passenger cars, respectively.

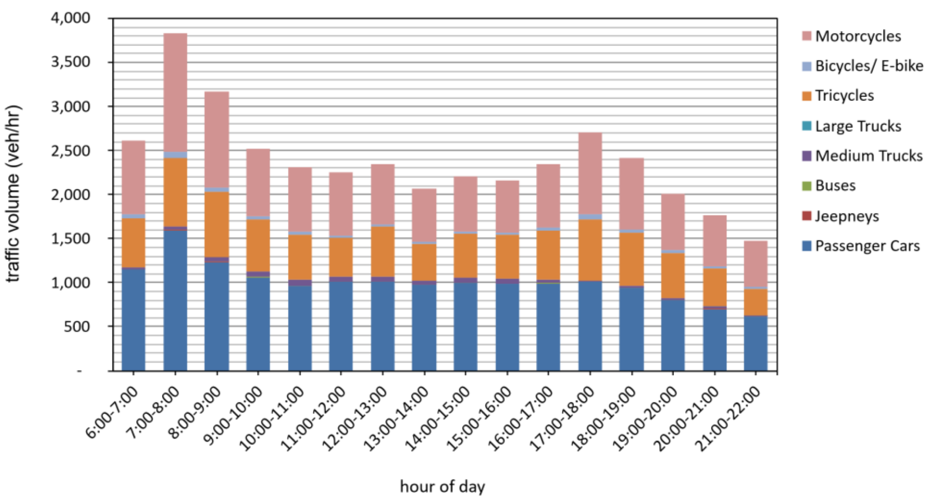


Figure 9. Pre-Intervention Weekday Station 1 Hourly Volume

During the Weekend Survey in the Pre-Intervention Phase a Station 1, the AM Peak hour is at 8:00 AM to 9:00 AM, as shown in Figure 10. This volume constitutes 1,668 vehicles in total, accounting for 6.88% of the total volume count in the 16-hour duration. In the afternoon, it is observed that the peak hour is at 17:00 to 18:00 (5:00 PM to 6:00 PM), with a volume of 1,907 vehicles accounting for 7.86% of the total traffic volume at station 1. Same with the weekday data at Station 1, the frequently occurring vehicle types are passenger cars and motorcycles, accounting for 43.65% and 29.92% of the total volume, respectively.

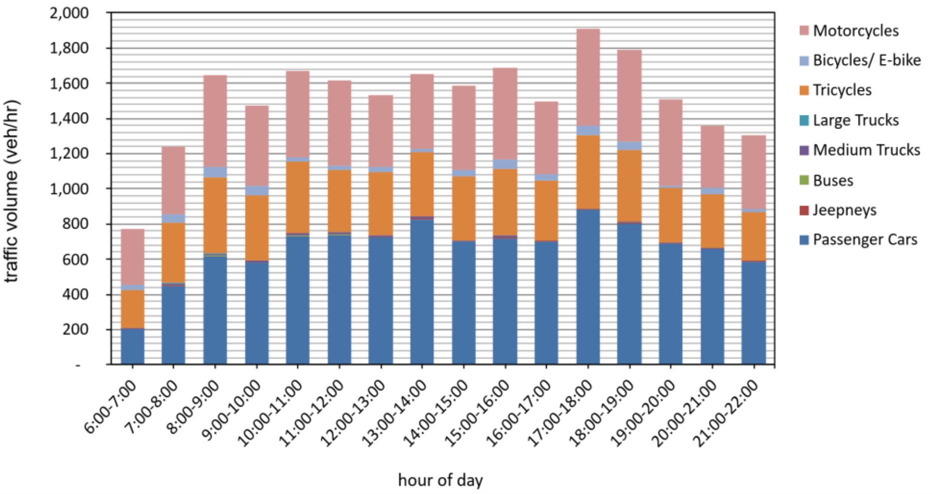


Figure 10. Pre-Intervention Weekend Station 1 Hourly Volume

During the Weekday Survey in the Pre-Intervention Phase a Station 2, the AM Peak Hour of the day is at 7:00 AM to 8:00 AM, as shown in Figure 11. This volume constitutes 2,433 vehicles in total, accounting for 8.04% of the total volume count in the 16-hour duration. In the afternoon, it is observed that the peak hour is at 17:00 to 18:00 (5:00 PM to 6:00 PM), with a volume of 2,605 vehicles accounting for 8.61% of the total traffic volume at station 2. Like the previous survey days, approximately 41.60% and 34.11% are comprised of passenger cars and motorcycles, respectively.

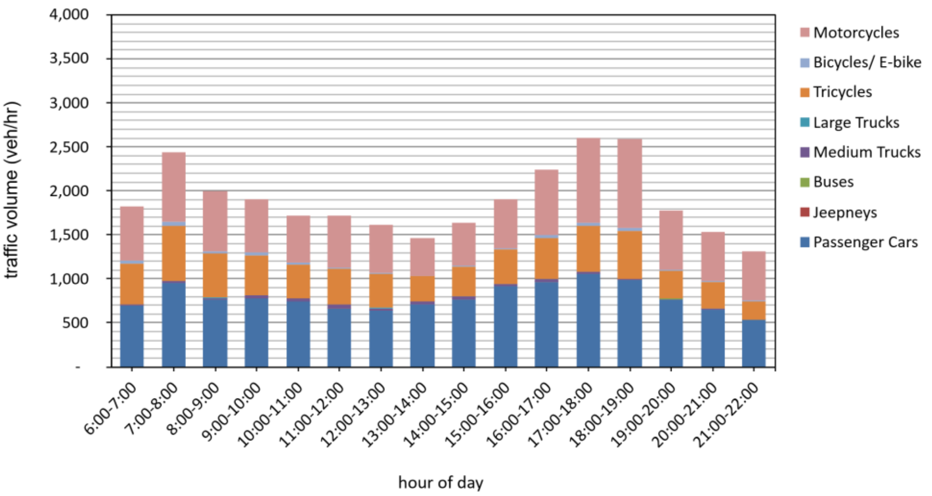


Figure 11. Pre-Intervention Weekday Station 2 Hourly Volume

During the Weekend Survey in the Pre-Intervention Phase a Station 2, it is evident that the peak hour of the day is at 8:00 AM to 9:00 AM, as shown in Figure 12. This volume constitutes 1,411 vehicles in total, accounting for 7.08% of the total volume count in the 16-hour duration. In the afternoon, it is observed that the peak hour is at 17:00 to 18:00 (5:00 PM to 6:00 PM), with a volume of 1,618 vehicles accounting for 8.12% of the total traffic volume at station 2. Similar to the above, approximately 33.83% and 42.03% are comprised of motorcycles and passenger cars, respectively.

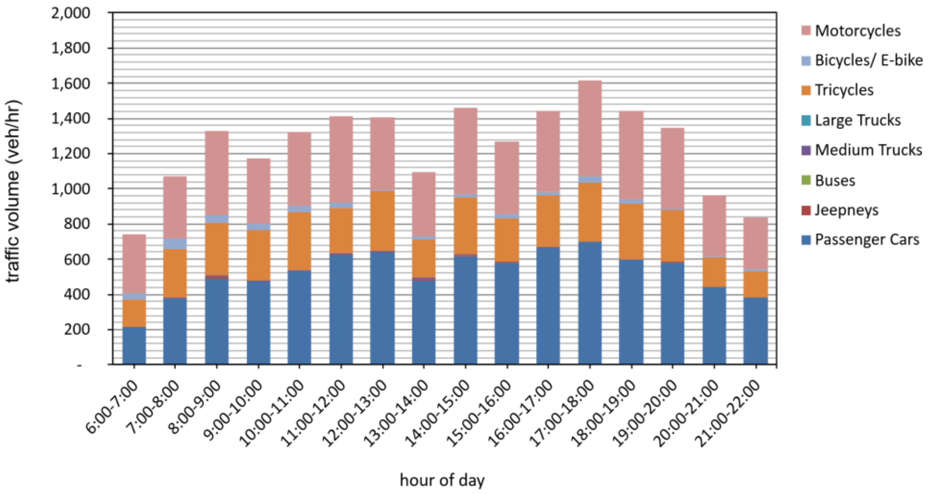


Figure 12. Pre-Intervention Weekend Station 2 Hourly Volume

Table 9 summarizes the AM and PM Peak Hours for Weekday and Weekends at the Pre-Intervention Phase.

Table 9. Summary of Peak Hour Data (Pre-Intervention)

Day of the Week	Peak Period	Traffic Count Station/ Intersection	Pre-Intervention	
			Period	Volume (veh/hr)
Weekday	AM Peak	Station 1: Maginhawa St. - Magiting St.	7 - 8 AM	3,830
		Station 2: Maginhawa St. - Masinsinan St.	7 - 8 AM	2,433
	PM Peak	Station 1: Maginhawa St. - Magiting St.	5 - 6 PM	2,707
		Station 2: Maginhawa St. - Masinsinan St.	5 - 6 PM	2,605
Weekend	AM Peak	Station 1: Maginhawa St. - Magiting St.	8 - 9 AM	1,668
		Station 2: Maginhawa St. - Masinsinan St.	8 - 9 AM	1,411
	PM Peak	Station 1: Maginhawa St. - Magiting St.	5 - 6 PM	1,907
		Station 2: Maginhawa St. - Masinsinan St.	5 - 6 PM	1,618

Though the Pre-Intervention morning peaks are seen from 8:00 AM to 9:00 AM, the morning peaks for the interim-post intervention and post intervention vary. For uniformity, the morning peak for weekends are set at 9:30 AM to 10:30 AM, following the rising traffic volume in the study area.

4.3 Intersection Analysis

The Level of Service (LOS) at the two unsignalized intersections, Maginhawa Street with Magiting Street (Station 1), and Maginhawa Street with Masinsinan Street (Station 2, was assessed for AM and PM peak hours during both weekday and weekend conditions across three study phases: Pre-Intervention, Interim Post-Intervention, and Post-Intervention. The analysis focused on minor traffic movements that yield to conflicting flows from the major road.

The results for Station 1 are summarized in Table 10. For weekday AM peak periods, right-turning vehicles from Magiting to Maginhawa consistently operated at LOS B to F, with no notable change across the three phases. However, left-turning vehicles from the south leg of Magiting St. showed some improvement during the interim and post-intervention phases. On weekends, LOS generally improved by at least one level (e.g., from LOS C-D to B). This suggests that the one-way configuration and associated calming measures during the interim period may have contributed to smoother left-turn execution and better gap availability.

Table 10. Summary Results of Unsignalized Intersection Analysis of Maginhawa St. – Magiting St. (Station 1)

Peak Hour	Minor Traffic Movement	Weekday			Weekend		
		Pre	Interim Post	Post	Pre	Interim Post	Post
AM Peak	Right turn into major road	B-F	B-F	B-F	A-B	A	A-B
	Left turn off major road						
	Traffic crossing major road						
	Left turn into major road	D-F	B-F	C to D-F	C-D	B	B
PM Peak	Right turn into major road	B	B	B	B	A	A-B
	Left turn off major road						
	Traffic crossing major road						
	Left turn into major road	D-F	B-D	C-F	C-F	B-C	B-D

Note: Blank cells represent non-existent traffic movements (LOS is not applicable).

As shown in Table 11, left-turning vehicles from Maginhawa to Masinsinan during the weekday operated at LOS E to F across all phases, indicating significant delays and congestion even before the intervention. In contrast, weekend AM peak data showed relatively stable LOS B throughout the three phases. However, during the PM peak, the LOS declined from B to C–D in the interim post phase and improved slightly to C in the post phase. This trend implies that the one-way configuration may have temporarily disrupted typical turning patterns, leading to degraded performance for left-turning vehicles.

Table 11. Summary Results of Unsignalized Intersection Analysis of Maginhawa St. – Masinsinan St. (Station 2)

Peak Hour	Minor Traffic Movement	Weekday			Weekend		
		Pre	Interim Post	Post	Pre	Interim Post	Post
AM Peak	Right turn into major road						
	Left turn off major road	E	E	F	B	B	B
	Traffic crossing major road						
	Left turn into major road						
PM Peak	Right turn into major road						
	Left turn off major road	F	F	F	B	C to D	C
	Traffic crossing major road						
	Left turn into major road						

The intersection analysis indicates that tactical urbanism interventions had mixed impacts on operational performance. Improvements were more evident during the weekend, particularly for left-turn movements at Station 1. However, congested conditions remained prevalent at Station 2 for weekday traffic, suggesting that the intersection's geometry or turning volumes may have been less adaptable to the interim one-way configuration.

4.4 Midblock Analysis

To further account for the total changes in the traffic volume count in the two intersections on the three phases considered, midblock analysis was employed in the data. This data analysis was used to check the level of service in terms of volume-capacity ratio, which will relate the decrease in volume due to the one-way scheme employed in Maginhawa St.

Table 12 shows the different sections considered in the study area, together with the number of lanes per section, the road width per section, and the capacity in passenger car unit per hour on all three phases. It should be noted that segments E-2 and 2-1 are removed in the Interim-Post Intervention Phase due to the restriction of Maginhawa St. to one-way scheme only. Following this, the capacity of segment 1-2 changed from 3,600 pcu/hr to 6,800 pcu/hr.

Table 12. Road characteristics of segments under study

Road	Dir.	Section	Segment (Link)	Lanes/ Width	Capacity (pcu/hr)	
					Pre, Post	Interim
Maginhawa St.	EB	Maginhawa-Mapagkawanggawa to Maginhawa-Magiting	B-1	2/ 12.2	3600	3600
	EB	Maginhawa-Magiting to Maginhawa-Masinsinan	1-2	2/ 12.2	3600	6800
	EB	Maginhawa-Masinsinan Intersection Southbound	2-E	2/ 12.2	3600	3600
	WB	Maginhawa South to Maginhawa-Masinsinan	E-2	2/ 12.2	3600	Removed
	WB	Maginhawa-Masinsinan to Maginhawa-Magiting	2-1	2/ 12.2	3600	Removed
	WB	Maginhawa-Magiting to Maginhawa-Mapagkawanggawa	1-B	2/ 12.2	3600	3600
Magiting St.	NB & SB	Magiting South to Maginhawa-Magiting and vice versa	1-C & C-1	2/ 6.1	3600	3600
	SB	Magiting North to Maginhawa-Magiting	A-1	2/ 9.5	3600	3600
Masinsinan St.	NB & SB	Masinsinan to Maginhawa-Masinsinan	2-D	2/ 6.1	3600	3600

Tables 13 and 14 show the Weekday Volume Capacity Ratio per road rection at the study area and their corresponding Levels of Service. It can be seen that on the Pre-Intervention Phae, all road sections have a VCR less than 0.50 which translates to LOS A – LOS B, which means free flow traffic. These findings are sustained in the Interim-Post Intervention Phase with two exceptions: in the morning peak hour, Link A-1 changed from LOS B to LOS C (moderate traffic) and Link 2-D changed from LOS B to LOS D (moderate/ heavy traffic).

Table 13. Volume-Capacity Ratio (Weekday) for Midblock Analysis

Volume - Capacity Ratio (Weekday)								
Road	Dir.	Link	Morning Peak Hour			Afternoon Peak Hour		
			Pre	Interim	Post	Pre	Interim	Post
Maginhawa St.	EB	B-1	0.2	0.19	0.16	0.2	0.15	0.15
	EB	1-2	0.3	0.15	0.23	0.28	0.12	0.18
	EB	2-E	0.16	0.19	0.17	0.11	0.11	0.11
	WB	E-2	0.07	Removed	0.07	0.09	Removed	0.05
	WB	2-1	0.08	Removed	0.08	0.08	Removed	0.05
	WB	1-B	0.46	0.44	0.41	0.24	0.2	0.22
Magiting St.	NB & SB	1-C & C-1	0.04	0.05	0.03	0.06	0.04	0.06
	SB	A-1	0.49	0.53	0.4	0.23	0.26	0.2
Masinsinan St.	NB & SB	2-D	0.28	0.34	0.3	0.32	0.42	0.31

Table 14. Level of Service (Weekday) for Midblock Analysis

Level of Service (Weekday)								
Road	Dir.	Link	Morning Peak Hour			Afternoon Peak Hour		
			Pre	Interim	Post	Pre	Interim	Post
Maginhawa St.	EB	B-1	A	A	A	A	A	A
	EB	1-2	B	A	B	B	A	A
	EB	2-E	A	A	A	A	A	A
	WB	E-2	A	removed	A	A	removed	A
	WB	2-1	A	removed	A	A	removed	A
	WB	1-B	B	B	B	B	A	B
Magiting St.	NB & SB	1-C & C-1	A	A	A	A	A	A
	SB	A-1	B	C	B	B	B	A
Masinsinan St.	NB & SB	2-D	B	D	B	B	B	B

Tables 15 and 16 show the Weekend Volume Capacity Ratio per road rection at the study area and their corresponding Levels of Service. It is noticeable in the midblock analysis that the VCRs in the weekends are all less than 0.50 which corresponds to free flow traffic (LOS A – LOS B).

Table 15. Volume-Capacity Ratio (Weekend) for Midblock Analysis

Volume - Capacity Ratio (Weekend)								
Road	Dir.	Link	Morning Peak Hour			Afternoon Peak Hour		
			Pre	Interim	Post	Pre	Interim	Pos t
Maginhawa St.	EB	B-1	0.11	0.09	0.08	0.14	0.11	0.1
	EB	1-2	0.16	0.08	0.11	0.21	0.1	0.14
	EB	2-E	0.09	0.1	0.09	0.1	0.13	0.1
	WB	E-2	0.03	Removed	0.05	0.06	Removed	0.05
	WB	2-1	0.05	Removed	0.04	0.07	Removed	0.05
	WB	1-B	0.16	0.16	0.18	0.18	0.17	0.18
Magiting St.	NB & SB	1-C & C-1	0.01	0.02	0.02	0.03	0.03	0.03
	SB	A-1	0.16	0.21	0.16	0.17	0.23	0.19
Masinsinan St.	NB & SB	2-D	0.15	0.17	0.15	0.17	0.27	0.21

Table 16. Level of Service (Weekend) for Midblock Analysis

Level of Service (Weekend)								
Road	**Dir.**	**Link**	**Morning Peak Hour**			**Afternoon Peak Hour**		
			Pre	**Interim**	**Post**	**Pre**	**Interim**	**Post**
Maginhawa St.	EB	B-1	A	A	A	A	A	A
	EB	1-2	A	A	A	B	A	A
	EB	2-E	A	A	A	A	A	A
	WB	E-2	A	removed	A	A	removed	A
	WB	2-1	A	removed	A	A	removed	A
	WB	1-B	A	A	A	A	A	A
Magiting St.	NB & SB	1-C & C-1	A	A	A	A	A	A
	SB	A-1	A	B	A	A	B	A
Masinsinan St.	NB & SB	2-D	A	A	A	A	B	A

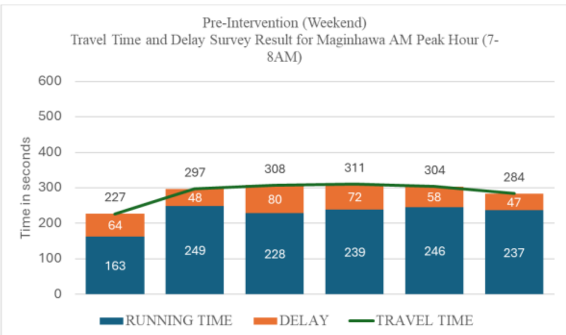
4.5 Travel Time and Delay

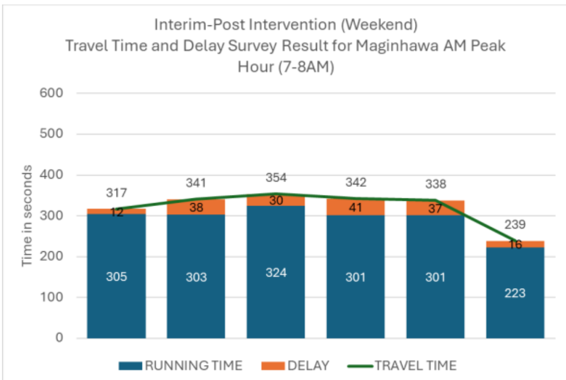
During the weekend morning peak hour, minimal to virtually no delays were observed in the post-intervention phase, as shown in Figure 13. Interestingly, the interim-post intervention period recorded the highest average running time among all phases, resulting in the greatest average travel time. This outcome can be attributed to the one-way traffic scheme that was put into effect during the interim-post intervention stage.

During the pre-intervention phase**,** the morning peak hour exhibited an average running time of 272.2 seconds, an average delay of 31.9 seconds, and an overall travel time of approximately 304.2 seconds. This suggests that vehicles experienced intermittent stops, with delays contributing modestly to the total travel time.

In the interim-post-intervention phase, designed as a transitional stage incorporating partial tactical urbanism measures, notable changes emerged. During the morning peak, the running time increased to 294.8 seconds while the delay decreased substantially to 17.2 seconds. Consequently, the overall travel time rose slightly to 312.0 seconds. The increase in running time, coupled with the decline in delay, underscores a shift toward more continuous vehicular movement, where vehicles spend more time in motion with fewer interruptions.

By the post-intervention phase, which entailed the full implementation of traffic management and street design improvements, further transformations were observed. In the morning peak, the average running time marginally increased to 296.8 seconds, while the delay dropped dramatically to just 5.3 seconds, yielding a stable travel time of 302.2 seconds. This near-elimination of delays indicates that the interventions effectively smoothed traffic flow, with travel times becoming almost entirely dictated by uninterrupted movement.





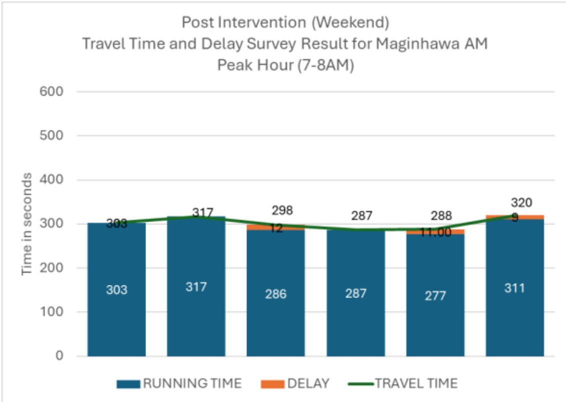


Figure 13. Travel time and delay results during the weekend morning peak hour (7-8 AM)

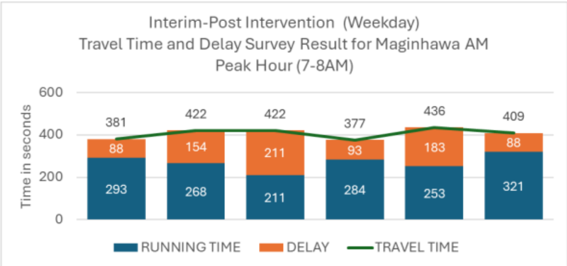
Figure 14 shows the travel time and delay results during the weekend evening peak hour. Like the trends observed in the morning peak hour, the evening peak hour during the interim-post intervention phase also experienced the highest average travel time. Delays were likewise notably greater during this period compared to the other phases. The average running time increased to 320.9 seconds, the delay surged to 126.5 seconds, and the total travel time rose markedly to 447.4 seconds. This significant evening delay indicates pronounced congestion and stop-and-go conditions, typical of commuter return flows.

The evening peak saw an uptick in both running time (352.4 seconds) and total travel time (462.1 seconds), although the average delay slightly decreased to 109.7 seconds. This suggests that while vehicles traveled longer distances without halting, potentially due to improved signal coordination or reduced friction, residual congestion still impacted evening operations. Running time rose slightly to 356.2 seconds, delay declined more significantly to 83.7 seconds, and travel time decreased to 439.8 seconds compared to both earlier phases. Although evening travel remained more variable, the reductions in delay suggest that interventions mitigated severe queueing and stoppages, even if overall travel remained somewhat elevated due to inherent demand during that time.

Figure 14. Travel time and delay results during the weekend evening peak hour (5-6 PM)

While running times increased slightly across phases, an indication of longer uninterrupted travel segments, and substantial decreases in delay led to stable or improved total travel times. This aligns with broader research on urban traffic calming and management, which highlights the role of interventions in not necessarily reducing speed but in enhancing the consistency and reliability of travel. The differential impact between AM and PM periods further reflects underlying demand patterns, where evening peaks continue to challenge system capacity, albeit with noticeable improvements in delay management.

For weekdays, during the AM Peak Hour, a comparison between the "Interim-Post Intervention" and "Post Intervention" phases indicates a reduction in overall delay times as shown in Figure 15. Notably, in the interim-post period, delays are significantly higher, peaking at 211 seconds, while in the post-intervention stage, delay values are more stable and consistently below 90 seconds, with one peak at 87 seconds. This suggests a positive outcome from the intervention measures, likely improving traffic flow and reducing stop-and-go conditions.



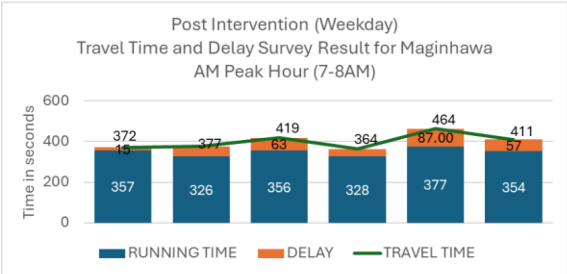


Figure 15. Travel time and delay results during the weekday morning peak hour (7-8 AM)

Conversely, the PM Peak Hour during the post-intervention period shows a dramatic increase in both running time and delay, as shown in Figure 16. Travel times peaked at 1268 seconds, with delays reaching 388 seconds, substantially higher than AM values. Although the running time increases steadily (reaching up to 897 seconds), the high delay values suggest severe congestion, possibly due to higher vehicular volume or inefficiencies in post-intervention traffic management during the evening peak.

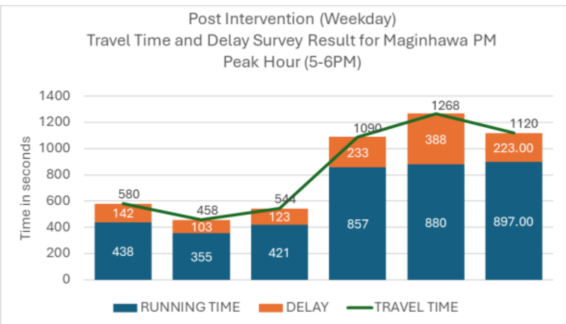


Figure 16. Travel time and delay results during the weekday evening peak hour (5-6 PM)

The intervention appears to have reduced delays during morning peak hours, supporting improved operational performance. However, the evening peak hour data indicates worsening conditions post-intervention, highlighting a need for differentiated or additional measures for the PM period. These findings are consistent with the notion that traffic interventions may yield time-dependent outcomes and should be evaluated across multiple time frames for comprehensive assessment.

4.6 Synthesis of Results

The tactical urbanism interventions along Maginhawa Street generated meaningful operational improvements, particularly at the Maginhawa–Magiting intersection, during weekend conditions, and in morning peak periods where delays were significantly reduced and traffic flow became smoother and more consistent.

These benefits, however, were not uniform across the corridor. The Maginhawa–Masinsinan intersection and the weekday evening peak hours exhibited limited or even negative outcomes, with post-intervention data showing persistent or worsened congestion, suggesting that geometric constraints, turning movement demands, and higher PM traffic volumes were not fully addressed by the implemented measures. Despite these localized challenges, midblock conditions consistently operated under free-flow levels of service, indicating that the corridor's issues were primarily intersection-focused rather than corridor-wide.

Overall, while the interventions improved reliability and reduced delays in several contexts, the mixed results highlight the need for more targeted strategies—particularly for Station 2 and PM peak hour operations—to fully optimize traffic performance along Maginhawa Street.

These findings align with ITDP's insights that tactical urbanism projects must establish clear and measurable goals, ensuring that the project's available resources, strategies, and design interventions are effectively directed toward the intended outcomes. Because transportation challenges are highly context-specific, strong communication with project stakeholders is essential. This dialogue allows planners to accurately identify localized issues, understand user behaviors, and integrate feedback that can meaningfully shape the project's design and implementation.

Moreover, the mobility indicators classified by GIZ and MoHUA (2020) including travel time, delay, and traffic speed was important in assessing general traffic conditions within the study area. These indicators provided quantifiable measures that helped frame the baseline mobility experience and evaluate how tactical urbanism interventions might influence vehicular movement.

5. CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

This study offers a multidimensional assessment of tactical urbanism (TU) by examining its operational traffic impacts along Maginhawa Street and its adjacent corridors. Using data collected across three intervention phases, the study demonstrates that TU interventions—specifically the temporary conversion to a one-way configuration—can be implemented without significantly compromising vehicular mobility under specific conditions.

The midblock level-of-service (LOS) remained within acceptable ranges (A to C) throughout all phases, suggesting that street reallocation did not push segments beyond capacity. At the intersection level, LOS fluctuated across movements and time periods but revealed a notable pattern: weekend peak-hour operations, especially in minor movements, benefited more than weekday PM flows. Travel time and delay results showed moderate variations, but reductions in delay post-intervention point to improved vehicle flow conditions after reversion to two-way traffic.

These results emphasize the value of integrating travel time analysis with localized LOS evaluations to identify both corridor-wide patterns and site-specific bottlenecks. Importantly, adjacent streets responded differently, indicating that TU interventions may redistribute—not eliminate—traffic, reinforcing the importance of a network-level perspective in TU design and assessment.

5.2 Recommendations for future research

Future studies should incorporate a broader network-level perspective, extending analysis beyond the immediate corridor to include a wider range of adjacent and parallel streets. This is particularly relevant in contexts where rerouting and traffic redistribution may occur because of temporary street reconfigurations. The scope of this study was limited by budget and data collection constraints, which restricted the analysis to specific hours and a narrow geographic segment. Future research should consider multi-day, multi-hour datasets and automated methods (e.g., continuous loop detectors or mobile app tracking) to capture temporal variability more accurately. There is a need to integrate additional performance dimensions such as safety (e.g., conflict analysis, pedestrian risk mapping) and equity (e.g., access for vulnerable users) to assess how TU interventions affect the broader public beyond vehicular metrics. Simulation-based tools, such as microscopic traffic models, could complement observational data and help test scenarios for scaling or replicating TU interventions in other urban contexts.

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