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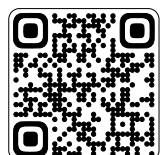
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IMPACT OF STREET VENDORS ON URBAN MOBILITY: A COMPREHENSIVE ANALYSIS OF ANOOPSHAHAR ROAD, ALIGARH

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ABSTRACT

Urban spaces are increasingly shaped by the interaction between formal and informal economic activities, with street vendors and roadside commercial activities taking a central role in the urban landscape. Street vending is essential to urban economies in developing countries like India, where it provides livelihoods for the urban poor. However, regardless of its economic and social significance, street vendors often pose various issues and challenges to urban mobility and sustainability, contributing to congestion, obstructing pedestrian pathways, no free pedestrian movement, hindering traffic flow, and conflicting with transport infrastructure.

In this research paper, the role of street vendors and their impact on urban mobility are studied along Anoopshahar Road, Aligarh. Data is collected and assessed based on certain parameters, analyzing effects on mobility and overall urban dynamics to generate possible solutions. Employing a mixed-methods approach, including surveys and interviews, observational studies, and case studies across multiple urban settings,

this research tries to provide a framework with the help of planning strategies and policy recommendations to strike a balance between the benefits of street vending and roadside commercial activities with the imperative of including street vending activities in efficient and safe urban environment.

Keywords: Street vendor, Informal activities, Urban Mobility, Planning Strategies, Urban Environment

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1. Introduction

Street vending and informal activities have become crucial income sources for India's urban poor due to the declining formal sector and increasing urban migration. Vending workers use their limited resources to address their issues, avoiding begging, thieving, or extortion. They do not demand government jobs or dignity, and their activities help them live with self-respect and dignity, regardless of the vendor's location or type. (Ray & Mishra, 2011)



Figure 1 Street Vending Activity on Anoopshahar Road, Aligarh. (Source: Author)

Street vendors play a vital role in urban planning, transforming underutilized areas into vibrant hubs that support the local economy and enrich the urban experience. They provide affordable goods and services close to where people live and work, supporting walkable, mixed-use neighborhoods and contributing to pedestrian-friendly streetscapes. Their presence also adds cultural vibrancy, as many vendors reflect the diverse backgrounds and traditions of the communities they serve. Integrating vending into zoning policies can formalize their presence, creating designated vending areas that balance vendors' needs with other urban stakeholders, ensuring public safety and accessibility.

Strategically placed vendors can offer "last-mile" services like snacks and convenience items for transit riders, contributing to the success of transit-oriented development (TOD) areas. When managed effectively, this integration can lead to a reduced need for short car trips, mitigating urban pollution and supporting cities' sustainability goals. However, street vending has remained underdeveloped in India, with the practice even being outlawed until the 2014 Street Vendors Act. Roadside vendors also cause turmoil in cities, intruding on public spaces and contributing to traffic congestion and accidents. (REPL, n.d.)

City governments must recognize the importance of street vendors in the social and economic fabric of city life and integrate them into their city development strategies to ensure their continued presence and impact. (REPL, n.d.)

The informal sector in India comprises businesses not registered with the government or a statutory authority and with fewer than ten employees. It accounts for 90% of the workforce, with 79% in urban areas being informal. In India, street vendors, individuals, or small enterprises account for 5% to 15% of the informal economy. They contribute over \$2 trillion to the global economy annually and serve low-income neighborhoods by offering affordable goods and services. They also support local economies by promoting local production, consumption, and circulation of products and services. Addressing challenges faced by informal workers is crucial for local economic development. (Dasgupta Sur et al., 2024)

The types of Street vendors in India include: i) Stationery vendors, ii) Mobile Vendors, iii) Peripatetic Vendors. (Ministry of Housing and Urban Affairs, n.d.)

Stationery vendors who, with authorization from the authorities, operate from a fixed site, such as pavements, sidewalks, or defined vending zones. Mobile vendors sell goods or services using bicycles, motorized vehicles, etc., and have no fixed location—mobility allows them to reach a larger buyer; they often provide products that are movable and adapt to different locations based on demand.

Peripatetic vendors that travel about streets or neighborhoods selling their goods while carrying them on foot, usually with the use of pushcarts.(Ministry of Housing and Urban Affairs, n.d.)

Street vending is linked to income instability, poor socioeconomic status, and consumer behavior. Street sellers face harassment, long hours, and a lack of city conveniences. Weather conditions, such as rain, heat, and winter wind, contribute to their problems. Site allocation uncertainty and scarcity of storage facilities further hinder their operations.(Jariwala, 2021)

Street vendors in cities cause congestion and pose serious obstacles to urban mobility, particularly in areas with high population density or foot traffic. They often set up shop near busy transit hubs, causing pedestrian walkways to be blocked, increasing the risk of accidents, and posing public safety threats. The lack of infrastructure for vendors, such as restrooms and storage spaces, further exacerbates these issues, leading to extra garbage and unhygienic conditions. (Jariwala, 2021). The Street Vendors Act, 2014, in India regulates street vendors' livelihoods, assigning zones, granting certificates, conducting surveys, and outlining relocation criteria, dispute resolution procedures, and operating conditions. (Ministry of Law and Justice, n.d.)

1.1 The Uttar Pradesh Scheme for Street Vendors, 2016

For the registration of street vendors, a survey is conducted. After that survey data filling is done, and within a span of 60 days license for vending is issued to street vendors.

There are certain terms and conditions for issuing the license to the street vendors:

1. Restrictions on building permanent structures for stationary vending.
2. Regular and timely payment of fees determined by the Town Vending Committee.
3. Waste from street vending is not to be thrown on roads, footpaths, or sewer lines.
4. Cleanliness and hygiene of vending areas and adjoining areas.
5. Vending only in the allotted place and time mentioned in the certificate.
6. Maintenance of civic amenities and safety of public property.
7. Ensure smooth flow of traffic/vehicles and public convenience.
8. Prohibition of selling prohibited goods and activities polluting the environment.
9. Relocation of street vendors to adjoining vending zones if necessary.
10. Variation of vending fees timely manner by the street vending committee. (National Association of Street Vendors of India NASVI, n.d.)

1.2 Case Studies

Strategically selected case studies of cities from India and globally address different challenges, policies, and practices that offer insights into the management of street vendors and

their incorporation into urban and transportation planning. The case studies selected will provide parameters for this research.

- 1. Bhubaneswar – Vending Zones (Odisha Model):** Bhubaneswar established India's inaugural large-scale vending zone model through a Public-Private-Community Partnership (PPCP). It established structured vending areas with specific stalls, illumination, waste disposal, and yearly permits. The initiative highlighted the importance of stakeholder involvement and adherence to the Street Vendors Act, 2014. (Raj & Jolly, 2020)
- 2. Ahmedabad – Jamalpur Flyover Model:** Ahmedabad effectively transformed under-flyover areas in places such as Jamalpur for structured street vending. This method emphasized the effective utilization of unused areas to minimize roadside intrusion and alleviate traffic congestion. Support from the municipality facilitated the development of infrastructure and improved management of vendors. (Raj & Jolly, 2020)
- 3. Bhopal – Bitten Market Time-Sharing Model:** Bhopal's Bitten Market launched a time-sharing vending system that allows vendors to utilize public areas (such as grounds) during non-peak times. This guaranteed flexible space, reduced overcrowding, and required collaboration with vendors. . (Raj & Jolly, 2020)
- 4. Bangkok, Thailand:** Bangkok implements a zoning-based vending policy that allows vendors to operate in specified areas, particularly near transit stations and marketplaces. Although designated areas assist in managing vending, unlicensed vendors continue to intrude into non-vending spaces, causing disturbances for traffic and pedestrians. Enforcement is irregular, leading to conflict between policy and implementation. (Kusakabe, 2014)
- 5. Singapore:** Singapore provides a centralized, strictly regulated framework in which all street vendors have been moved to designated hawker centres. These facilities are properly equipped, uphold strict hygiene standards, and preserve culinary traditions. The outcome is a tidy, well-structured urban streetscape with few issues between vehicles and pedestrians.(Ministry of foreign affairs, n.d.)
- 6. Cape Town, South Africa:** Cape Town integrates vending into historical and cultural zones like Greenmarket Square with a focus on both tourism and vendor livelihood. Vending is allowed in numbers, and vendors are issued permits and provided with semi-permanent stalls, balancing commercial vibrancy with spatial discipline. (Project for Public Spaces, 2005)

7. **Brahmaputra Market (Sector 29, Noida):** This market developed naturally over time and features a combination of official stores and informal street sellers. Due to its redevelopment, it experiences less traffic congestion & has sufficient organized space and parking. (Source: Author)
8. **New Brahmaputra Market (Sector 37, Noida):** This market was specifically designed to provide space to vendors who moved from Sector 29 post redevelopment. It features a more organized design with booths and assigned parking, and seeks to alleviate crowding in the original market region. (Source: Author)
9. **Chandigarh (Rehri Market, Sector 15):** Since 1992, evolved from an informal selling area into an established framework. It includes assigned stalls, weekly produce markets, and a solid adherence to the Street Vendors Act, 2014. Vendor charges and specific waste management are also established. (Source: Author)

Table 1 Comparative Analysis of National, International, and Live Case Studies for Street Vending Strategies (Author)

Planning Parameter	Ahmedabad (Jamalpur)	Bhopal (Bitten Market)	Bhubaneswar Market (Vending Zones)	Singapore	Bangkok	Capetown	Brahmaputra Market (Sector 29, Noida)	New Brahmaputra Market (Sector 37, Noida)	Chandigarh (Rehri Market, Sector 15):	Key Inferences for the study area
Planning Approach	Reused under-flyover spaces	Time-sharing model using open grounds	Public-private partnership	Centralized hawkker centres	Vending area along the streets	Fixed vending zones in heritage space	Redeveloped into a formalized market complex	Purpose-built relocation market	Formalized informal vending zone	Create a hybrid approach: use repurposed & dedicated spaces with clear policy alignment
Space Utilization	Optimizing dead	Multi purpose usage of	Dedicated vending zone	Permanent hawkking	Designated but often	Use of public	Internalized vendor shops	Structured stalls	Booth with court	Allocate time-sharing and fixed-use zones per space

	spaces	playgrounds		centres	encroached vending zones	spaces	and walkways		yards	availability and traffic intensity
Vendor Capacity	249 stalls	1.8m x 2.4m space provided	2000 vendors across 30 zones	Depends on stall availability	Depends on the availability of space	Depends on the vendor's space stalls	Fixed within the redeveloped market	Structured allocation	-	Regulate numbers through permit and demand mapping; limit zone saturation
Infrastucture Provided	Parking, lights, and stall structures	Electricity, toilet, drinking water, and temporary shades	Permanent kiosks, waste bins, and CFL lights	Sanitation, water, seating, structure	Vending area.	Semi-permanent stalls	Signage, public toilets, drainage, seating area, lighting, and fountain area	Permanent stalls, water/electricity	Semi-permanent booths, corridors.	Build stalls, water access, sanitation, signage; ensure uniform quality
Parking Infrastucture	Space provided for parking	Separate parking space	Parking spaces provided	Designated parking areas	Lack of parking infrastructure	Visitor/vended. Parking available	Availability of parking spaces	Limited parking provided	Dedicated parking spaces	Implement parking bays/pull-offs to avoid road occupation by vendors and vehicles
Impact on Pedestrian Flow	Organized stalls improve access	Reduced conflicts due to timing	Sidewalk vending is organized in zones	Clear pedestrian-only walkways	Space provided according to street width	Walkable paths due to fixed layout	Walkable pedestrian pathway	Improved walkability via organized layout	Clear vendor-pedestrian paths	Plan sidewalks + vendor lines; mark vending & pedestrian zones clearly
Traffic Congestion	Traffic management	Minimized due to time sharing	Reduced traffic congestion and carbon	Minimal due to off-	Often disrupted by	Managed via layout	Traffic management after	Lower congestion	A separate area for	Separate vending from vehicular zones; junction

	via no parking outside the designated area	g and parking infrastructure	footprints	road vending	illegal vending	ut + caps	redevelopment	post-relocation	vending maintains traffic flow	redesign needed at high vendor density points
Waste Management	-	-	Dust bins to collect garbage	Efficient and organized waste collection	-	Paid disposal by vendors	Drainage, bins in redevelopment	-	Paid service with a monthly fee	Introduce waste segregation, collection bins and disposal fee per vendor
Policy Alignment	Partially aligned	Partially aligned	High alignment with the SV Act 2014	Hawker policy backed by regulations	Highly aligned	Permit-based, historic conservation integrated	Compliance post-redevelopment	-	Full compliance with the SV Act 2014	Fully implement Street Vendors Act with enforcement and support
Challenges	Yet to be used	-	Initial high setup cost	High setup + hygiene regulation	Enforcement and illegal vending	Enforcement consistency	High pedestrian movement enforcement and vendor fairness	Compliance enforcement	Maintenance + vendor compliance	Develop a phased enforcement + support system with grievance redressal
Repliability	Medium for under-utilized infra	High in large public spaces	High if space and funding are available	High cost, applicable in high-density	Involvement of Government policy	High in heritage/tourist cities	Highly successful urban model	High for growing cities	High for medium-sized towns	Choose a model based on land availability, urban density, and enforcement ability

	structure			cities						
Urban Aesthetics	Organized under a structure	-	Kiosks, improved look	High standards – aesthetic centres	Visual clutter, unless enforced	Cultural integration with aesthetics	Visually unified layout	Organized visually	Clean, open, organized	Adopt modular, branded stall types with consistent signage and color codes.

Study Area

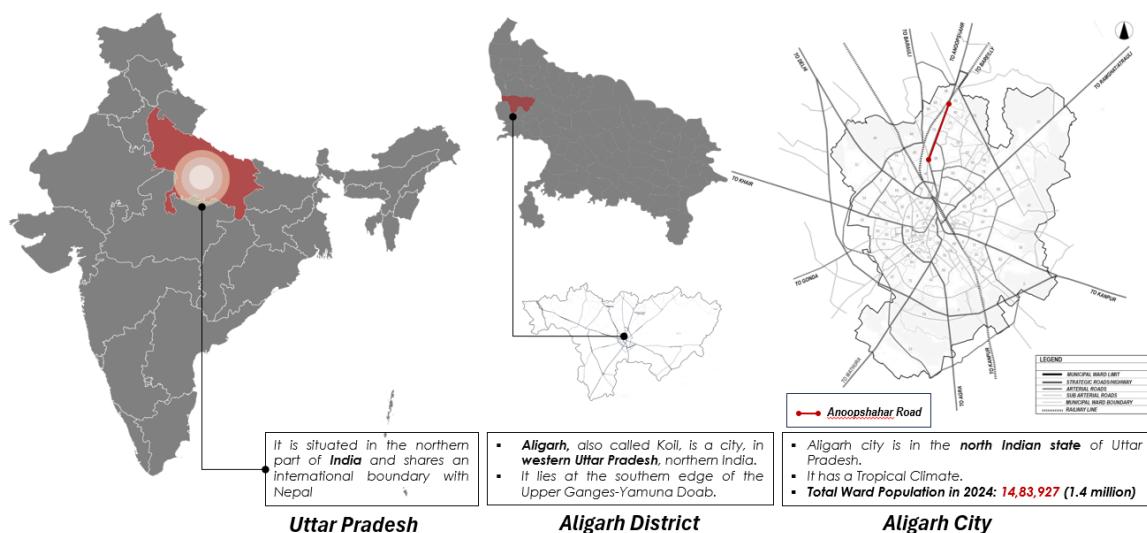


Figure 2 Location of study area (Source: Author)

Our study area is along Anoopshahar Road, which is a stretch of 2.6 km starting from the Jamalpur flyover till the Shamshad market junction. The study area is a busy city urban road, which is perfect for observing street vendors' influence on urban mobility and public space. The proximity of the road to major destinations, including Aligarh Muslim University (AMU) and local markets, traps several vendors. The dense concentration of vendors offers a special setting to view informal commercial activity interactions with urban infrastructure. Its closeness to AMU attracts a diverse population, and hence, the street vending here is a good site to observe across different age groups. This road offers a timely case study to evaluate regulatory and infrastructural interventions for accommodating the street vendors without losing urban mobility. It also has problems such as congestion, space-use conflicts, and

sanitation, which can prove very useful in formulating inclusive urban planning policies and planning strategies. Our study area is divided into 3 zones for conducting surveys.

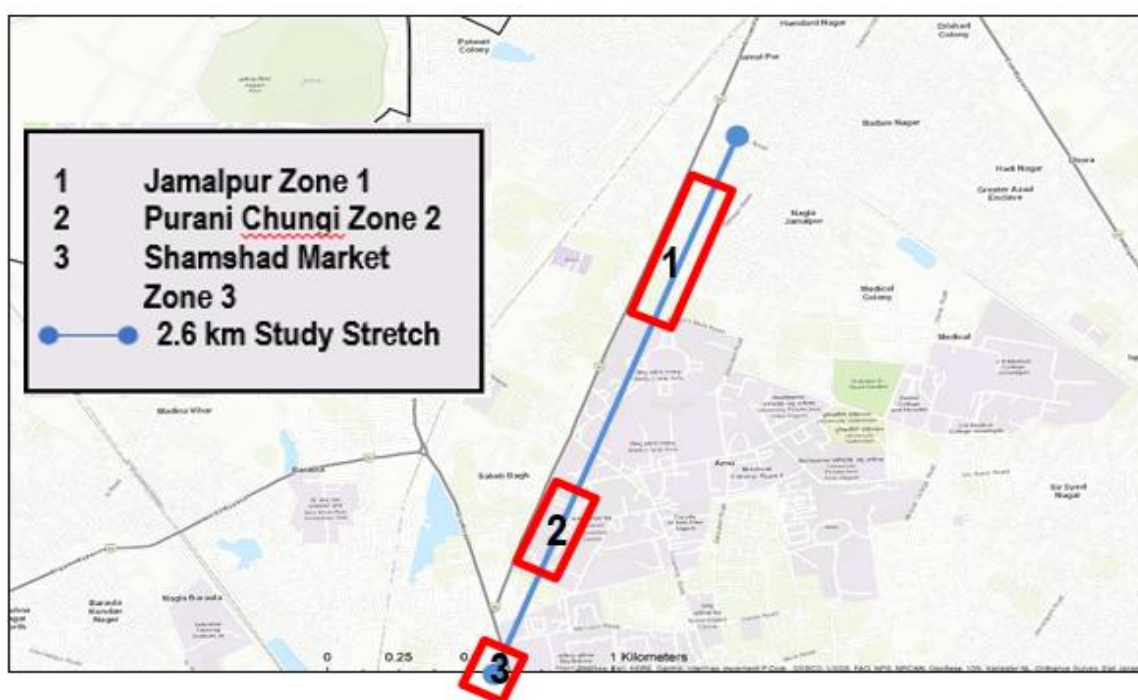


Figure 4 Study stretch with zones of survey (Source: Author)

2. Methodology

This research adopts a quantitative data collection method to examine the impact and role of street vendors on urban mobility along Anoopshahar Road in Aligarh. Primary data was collected through a traffic volume count survey, pedestrian count survey, and street vendor mapping using both manual observation and videography, conducted between 9 AM and 9 PM. Traffic data was classified by vehicle type—2-wheelers, 3-wheelers (including e-rickshaws), 4-wheelers, and LCVs/HCVs—and analyzed using PCU values and IRC guidelines to compute Volume-to-Capacity (V/C) ratios and Level of Service (LOS). Pedestrian movement and interactions with vendors were observed through video footage and counted manually. Street vendors were categorized by type (mobile, peripatetic, stationary) and by the goods or services offered. Data analysis was performed using Microsoft Excel, GIS tools, and referenced IRC:106-1990 and the Indian Highway Capacity Manual. Secondary data sources included the Aligarh Master Plan 2031, the Street Vendors Act, 2014, and the policies of the Street Vendor Act 2014.

3. Result and Findings

Anoopshahar Road is facing significant urban mobility issues due to unregulated street vending and poor road infrastructure. The lack of footpaths and street vending areas leads to pedestrian-vehicle conflict. High congestion is exacerbated by the absence of proper implementation, pull-off bays, pedestrian walkways, frontage zones, and pedestrian crossings. Litter and incompatible land use create visual clutter and hygiene issues, reducing effective carriageway width and affecting the free movement of vehicular and pedestrian traffic.



Figure 5 Encroachment by vendors is narrowing the carriageway and disrupting traffic flow. (Source: Author)



Figure 6 Vendor density is unregulated, especially at high-activity nodes like Jamalpur.

(Source: Author)



Figure 7 High pedestrian–vehicle–vendor interaction causes continuous conflict and delays.

(Source: Author)



Figure 8 Blocked pedestrian movement due to Illegal Vendors. (Source: Author)



Figure 9 No pull-off bays causing e-rickshaws to stop in moving traffic, creating bottlenecks.

(Source: Author)

The observational and visual survey of Anoopshahar Road uncovers high street vending activity, consisting of the critical issues related to urban mobility. Figure 4 depicts that Encroachment by vendors is extensive, mainly in high-activity areas like Jamalpur, where roadside street vendor stalls, carts, and semi-permanent setups narrow the effective width of the carriageway, creating severe traffic and pedestrian conflicts and congestion. Figure 5 depicts that the vendor density remains unregulated, with vendors occupying both sides of the road, even space in front of government-provided vending zones, extending up to footpaths and intersections, leaving no space for regulated flow.

In multiple areas of Anoopshahar Road, pedestrian pathways are blocked, compelling pedestrians to walk on the road and increasing the risk of accidents, as depicted in Figure 7. The lack of pull-off bays for e-rickshaw vehicles leads to random halts, which further increase traffic bottlenecks as depicted in Figure 8. This results in continuous vehicle–vendor–pedestrian interaction, making the road unsafe and non-functional for all users as shown in Figure 6.

The current conditions violate the principles outlined in the Street Vendors (Protection of Livelihood and Regulation of Street Vending) Act, 2014, which calls for designated vending zones and ensures the protection of pedestrian movement.

3.1 Street Vendor Distribution

To analyze the impact of street vendors on urban mobility along Anoopshahar Road, multiple surveys were conducted, which include the Street Vendor Survey, Traffic Volume Count Survey, and Pedestrian Count Survey. These surveys identified important data related to vendor types, pedestrian and vehicular movement patterns, and the extent of interaction between vendors and road users. The findings from these surveys have been shown using pie charts to illustrate the distribution and proportions of various observed parameters. These graphical representations emphasize key mobility challenges, such as high rates of vendor interactions, the dominance of specific vehicle types, and encroachments that affect pedestrian safety.

Distribution of street vendor based on establishment

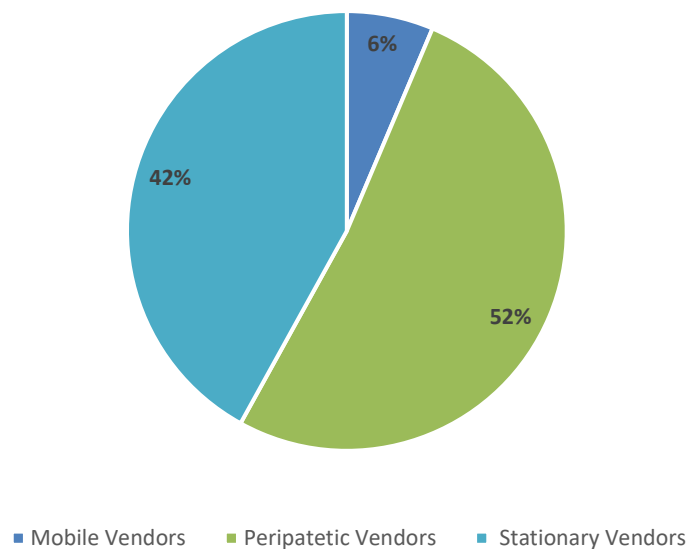


Figure 10 Distribution of street vendors based on establishment (Source: Author)

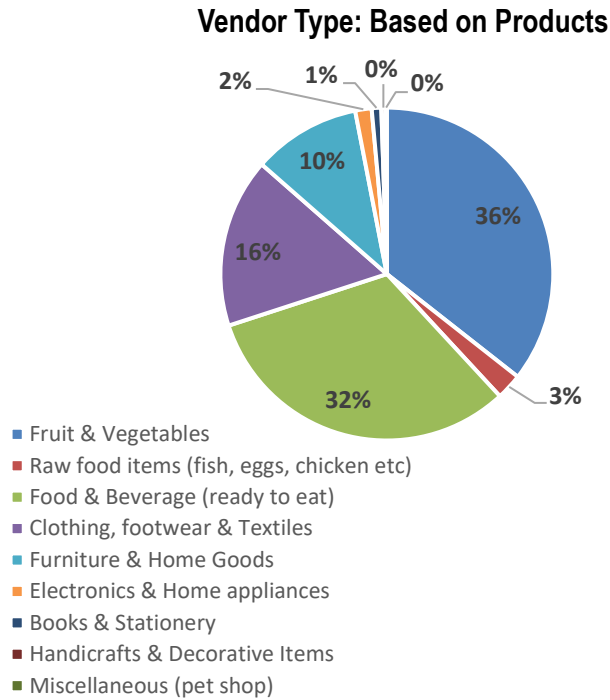


Figure 11 Percentage of vendors based on products (Source: Author)

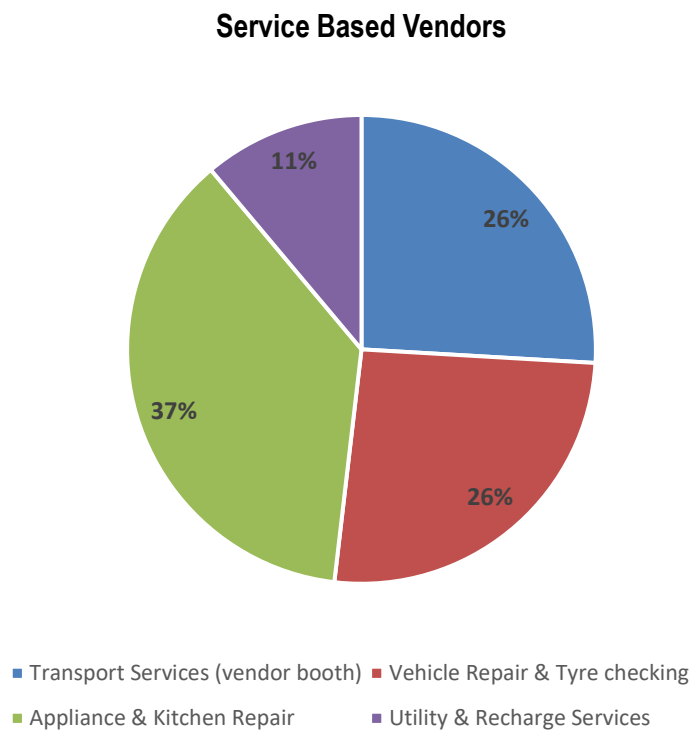


Figure 12 Percentage showing service-based vendors. (Source: Author)

A total of 780 vendors were identified and categorized into Product-Based Vendors (753) and Service-Based Vendors (27). The data was further classified based on their vending

type: Mobile Vendors, Peripatetic Vendors, and Stationary Vendors. The survey data shows that peripatetic vendors make up 52% of the total vendors. Stationary vendors, who operate from immovable spots, impact pedestrian mobility and contribute to road obstruction. Mobile vendors (in this case, considered motor vehicle vendors) represent only 6%.

3.2 Traffic Volume Count

To assess the vehicular flow pattern and its interaction with roadside commercial activities and street vendors, a Traffic Volume Count Survey was conducted at 3 zones of Anoopshahar Road.

The vehicles were categorized into 6 types:

2-Wheelers (motorcycles, scooters, bicycles), 3-Wheelers (cycle rickshaws and cycle rickshaws).

E-Rickshaws, 4-Wheelers (cars), Light Commercial Vehicles (LCVs), Heavy Commercial Vehicles (HCVs), and Buses (combined as one category).

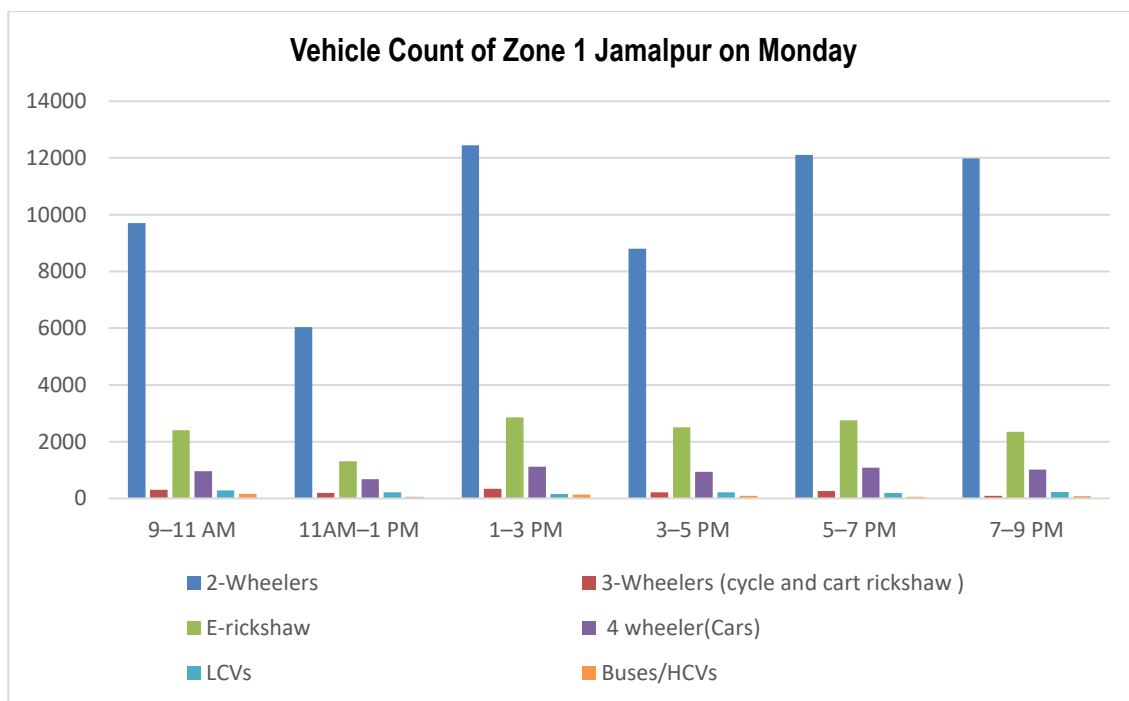


Figure 13 Vehicle count of Zone 1, Jamalpur on Monday (Source: Author)

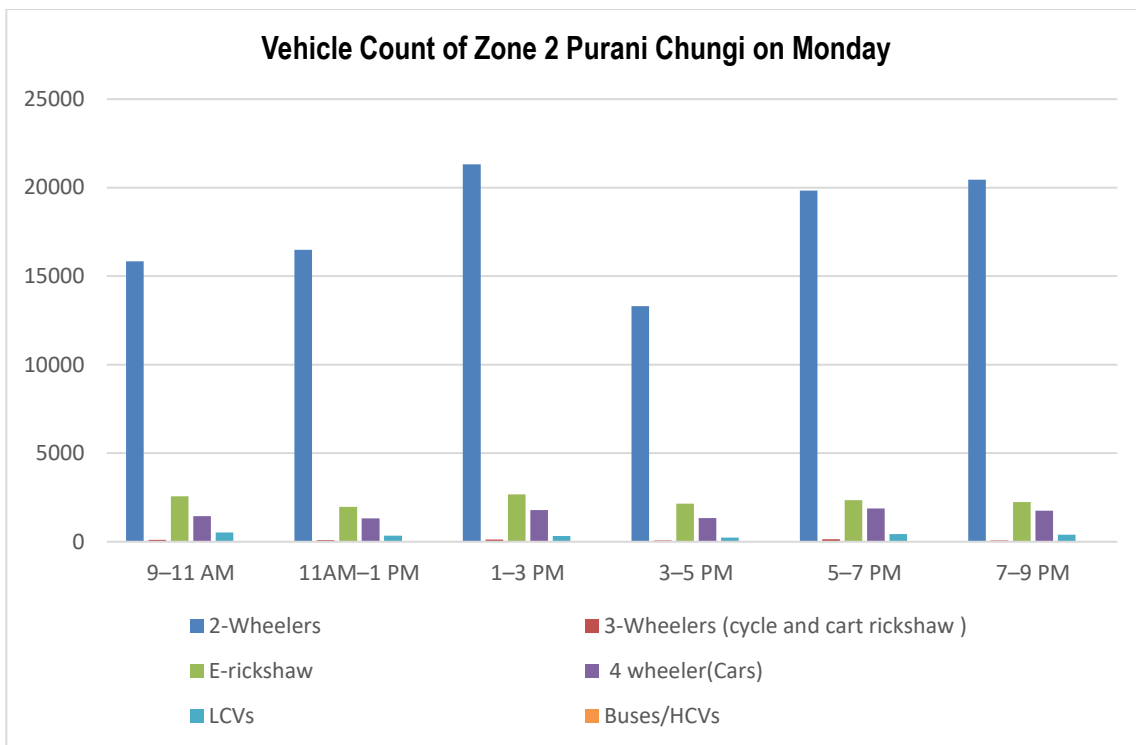


Figure 14 Vehicle count of Zone 2, Purani Chungi on Monday (Source: Author)

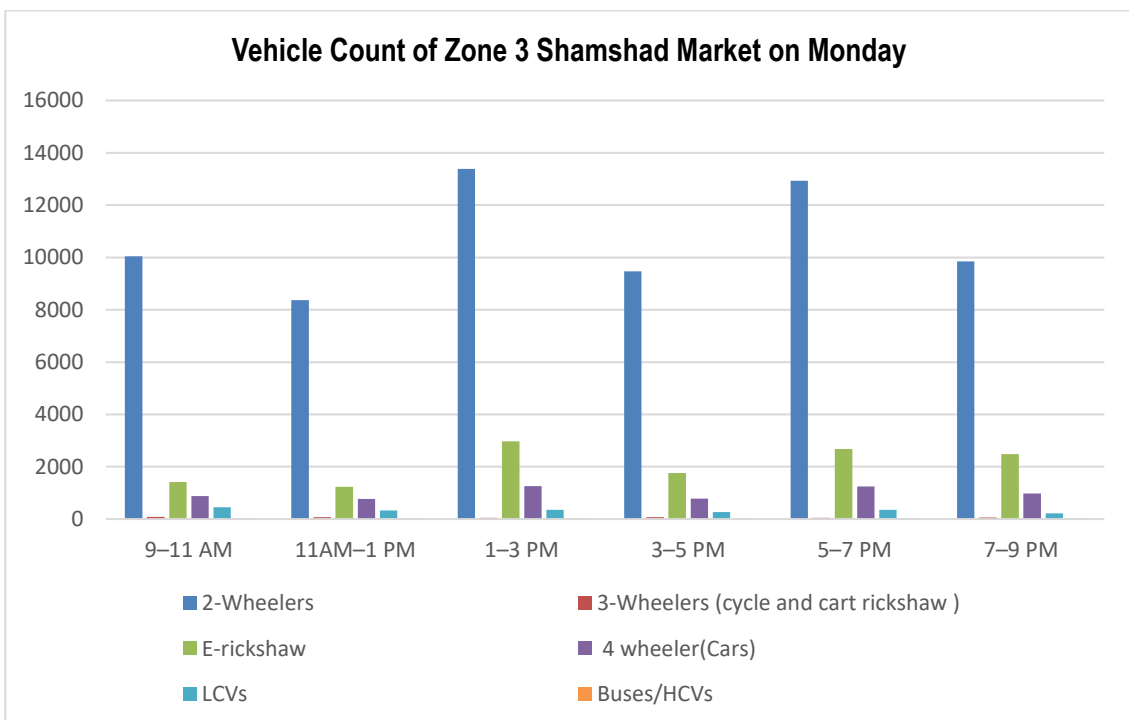


Figure 15 Vehicle Count of Zone 3, Shamshad Market on Monday (Source: Author)

The result of the survey, Vehicle count data in Jamalpur (Zone 1), Figure 12, shows that 2-wheelers lead the traffic movement, with over 12,441 recorded during peak hours between 1-3 PM. E-rickshaws are present throughout the day, with spikes during 1-3 PM and 5-7 PM. 4-wheelers remain lower, but steady during afternoon and evening periods. 3-wheelers and LCVs contribute minimally, while buses and HCVs show the least movement. Vehicle count data in Purani Chungi (Zone 2), Figure 13, shows that 2-wheelers again lead the traffic movement, with around 21325 recorded during peak hours between 1-3 PM. Vehicle count data in Shamshad Market (Zone 3), Figure 14, shows that 2-wheelers dominate the traffic movement, with around 13383 recorded during peak hours between 1-3 PM.

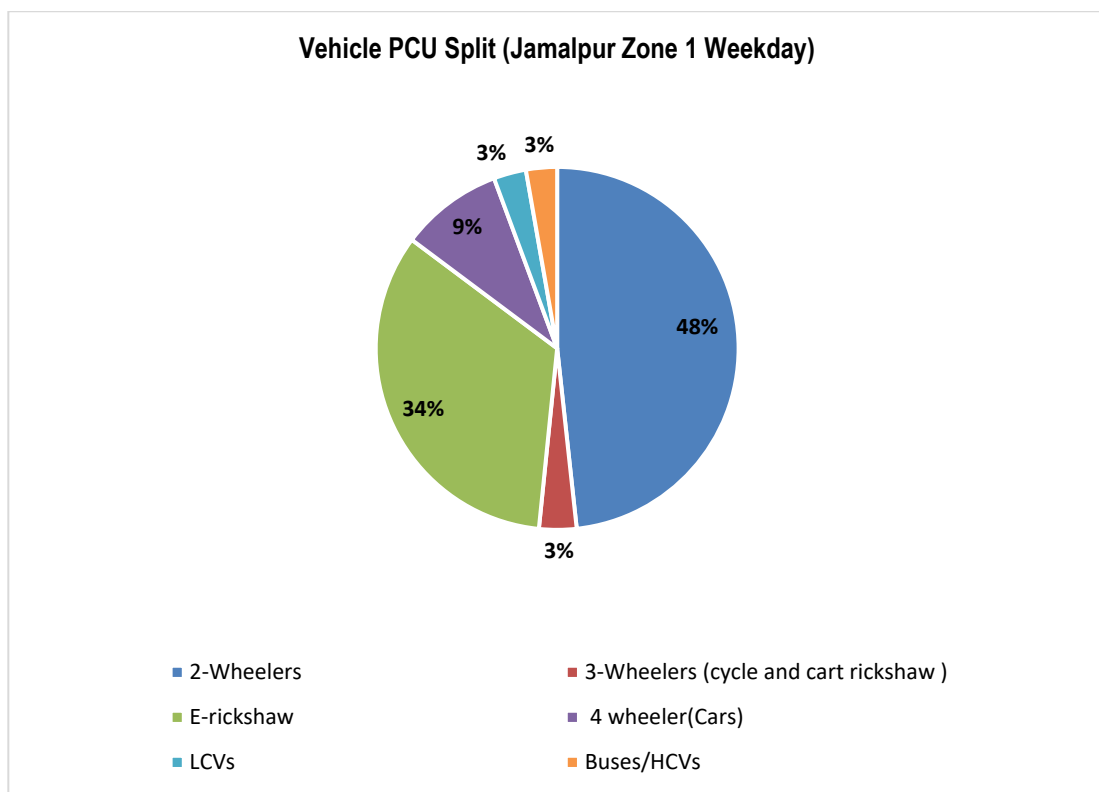


Figure 16 PCU split of Jamalpur on Monday (Source: Author)

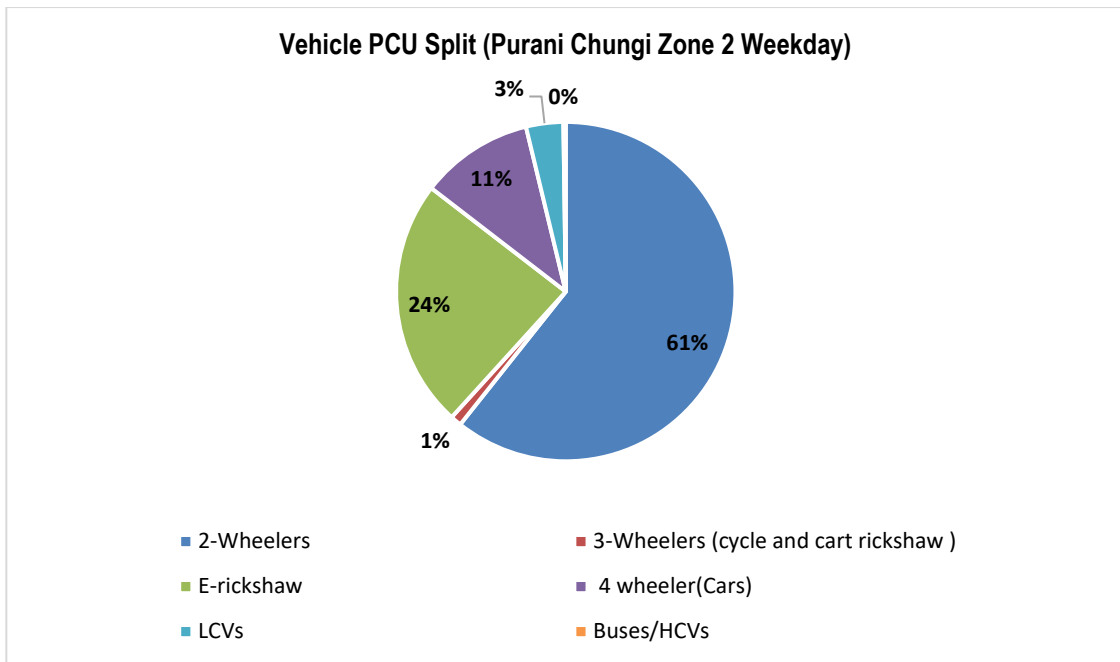


Figure 17 PCU split of Purani Chungi on Monday (Source: Author)

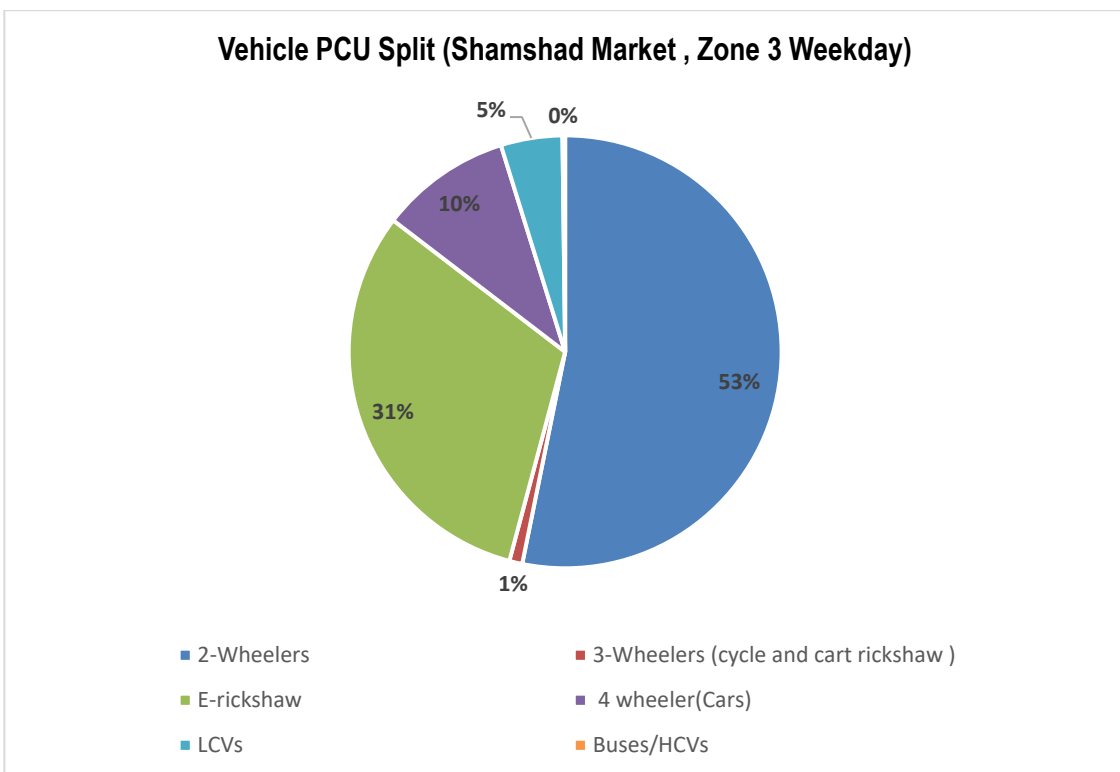


Figure 18 PCU split of Shamshad Market on Monday (Source: Author)

The breakdown of the Vehicle PCU (Passenger Car Unit) over three weekday zones in the city—Jamalpur Zone 1, Purani Chungi Zone 2, and Shamshad Market Zone 3—indicates a frequency of 2-wheelers, particularly in Purani Chungi (61%) and Shamshad Market (53%). E-

rickshaws constitute a considerable proportion in all three zones, reaching as high as 34% in Jamalpur. Cars (four-wheelers) make a modest contribution, ranging from 9% to 11%.

The proportion of 3-wheelers (cart and cycle rickshaws), LCVs, and Buses/HCVs is uniformly low across zones, each generally accounting for 0–3% of the overall PCU.

PCU values for each vehicle type were assigned based on IRC:106-1990 standards.

For e-rickshaws, a PCU value of 1.5 was considered based on MoHUA-recommended practices.

The Anoopshahar Road, with a carriageway width of 7.5 meters each falls under the sub-arterial road category as per Indian Roads Congress (IRC) guidelines. Based on standard IRC norms, such a sub-arterial road has a design traffic capacity of approximately 2400 Passenger Car Units (PCU) per hour.

*Table 2 The zones of Anoopshahar road across 3 zones depict congestion with LOS F
(Source: Author)*

No.	Zones	Volume/hour	V/C ratio	Level of Service	Traffic State and Condition
1	Jamalpur	5269.78	2.19	F	Breakdown flow
2	Purani Chungi	7364.4	3.06	F	Breakdown flow
3	Shamshad Market	7077.16	2.94	F	Breakdown flow

Anoopshahar Road analysis, indicates serious traffic congestion in three major zones—Jamalpur, Purani Chungi, and Shamshad Market. The count demonstrates a Level of Service (LOS) F, implying a breakdown flow condition and over-saturation by a high severity and thus requiring urgent traffic management measures and infrastructure development.

4. Vehicle and Vendor Interaction

Vendor Interaction Survey at Jamalpur Junction on an ordinary weekday (Monday) for 12 hours from 9 AM to 9 PM captures the interaction among vehicular traffic of different modes and vendor-pedestrian dynamics. The dataset was organized in 2-hour blocks to show variations in different time slots. The observed vehicle categories were two-wheelers, three-

wheelers (hand carts and cycle rickshaws), e-rickshaws, four-wheelers (private cars), light commercial vehicles (LCVs), and heavy commercial vehicles (HCVs/Buses). The total number of vehicles (TVC) was noted for each time slot, together with the number of vendor interactions observed. The vehicle interaction is observed in such a way that if the pedestrian/vehicle stops and stays at a vendor for 15 or more seconds, it will be counted as an interaction.

Table 3 Total Vendor Interaction at Study Zones (Source: Author)

Study Zone	Total Vendor Interaction % per Day
Jamalpur	2.40
Purani Chungi	0.95
Shamshad Market	0.43

The statistics depict an evident peak in vendor-pedestrian interaction in the morning and late afternoon periods, corresponding with maximum footfall and vehicular traffic. Although two-wheelers and e-rickshaws were the prevalent mode of transportation, the visibility of automobiles and LCVs also added to the congestion. The rate of interaction, determined as a percentage of interactions over the volume of vehicles, was constant, indicating the continuous engagement of pedestrians and street vendors all day. This persistence shows that vendors are a persistent and predictable element of urban streetscapes and have an active role in controlling pedestrian and vehicle user flows and behavior.

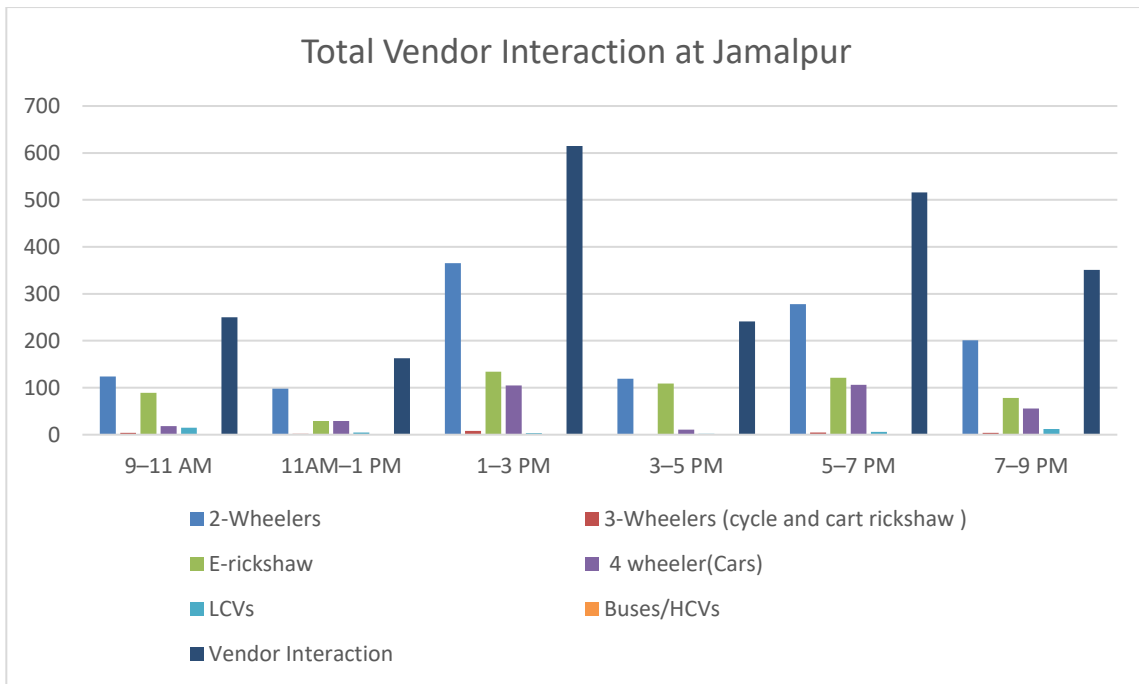


Figure 19 Vendor Interaction at Jamalpur (Source: Author)

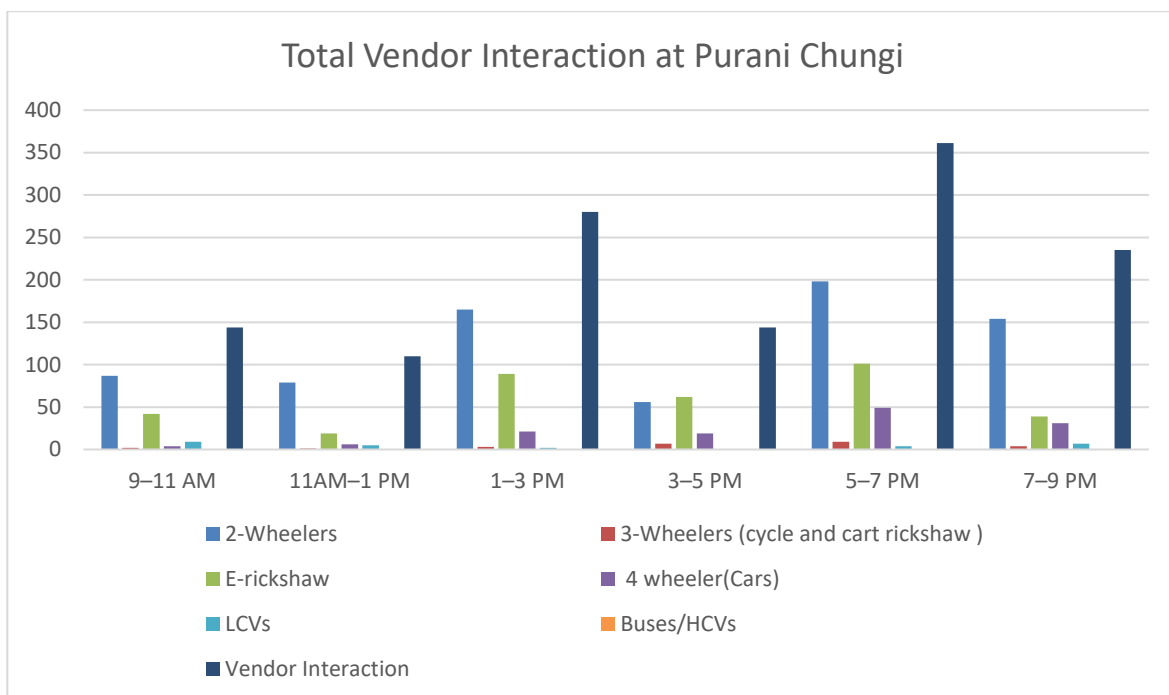


Figure 20 Vendor Interaction at Purani Chungi (Source: Author)

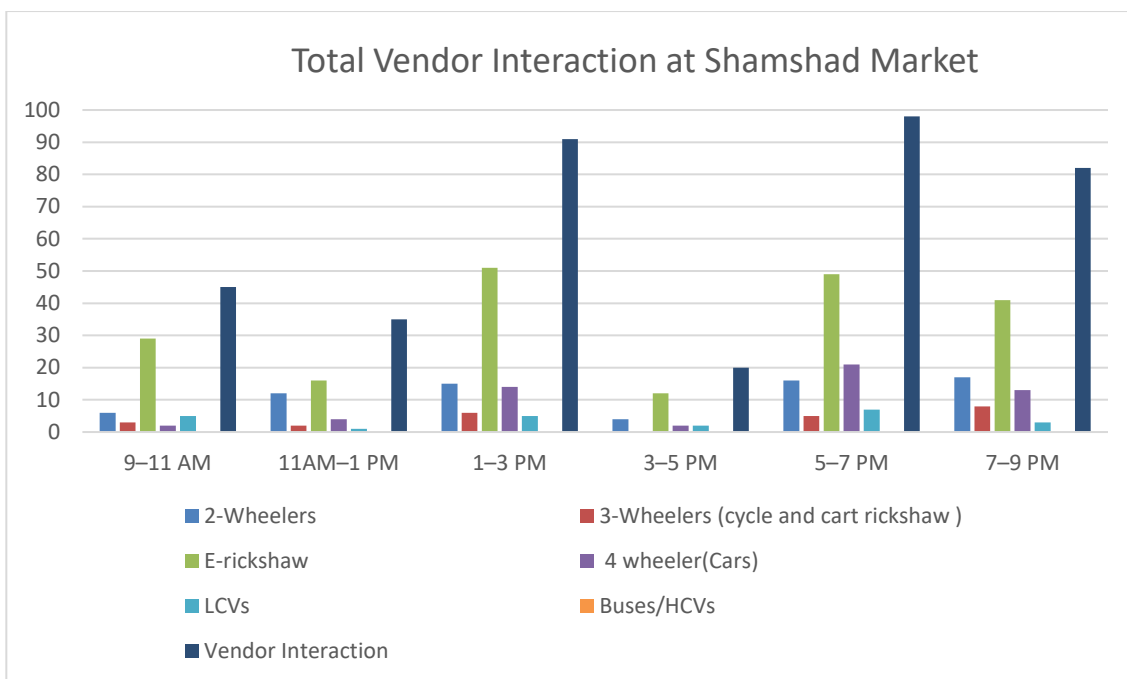


Figure 21 Vendor Interaction at Shamshad Market (Source: Author)

In exploring the dynamics of vehicle–vendor interactions in various urban areas, it was noted that e-rickshaws have the most frequent interactions with street vendors at Shamshad Market. Conversely, two-wheelers show more interaction with dealers in the other two regions surveyed.

In all the locations, four-wheelers (automobiles) are always the third most interacted vehicle type with street vendors, after e-rickshaws and two-wheelers.

4.1 Pedestrian Count

To assess the pedestrian flow and its interaction with roadside commercial activities and street vendors, a Pedestrian Count Survey was conducted at 3 zones of Anoopshahar Road.

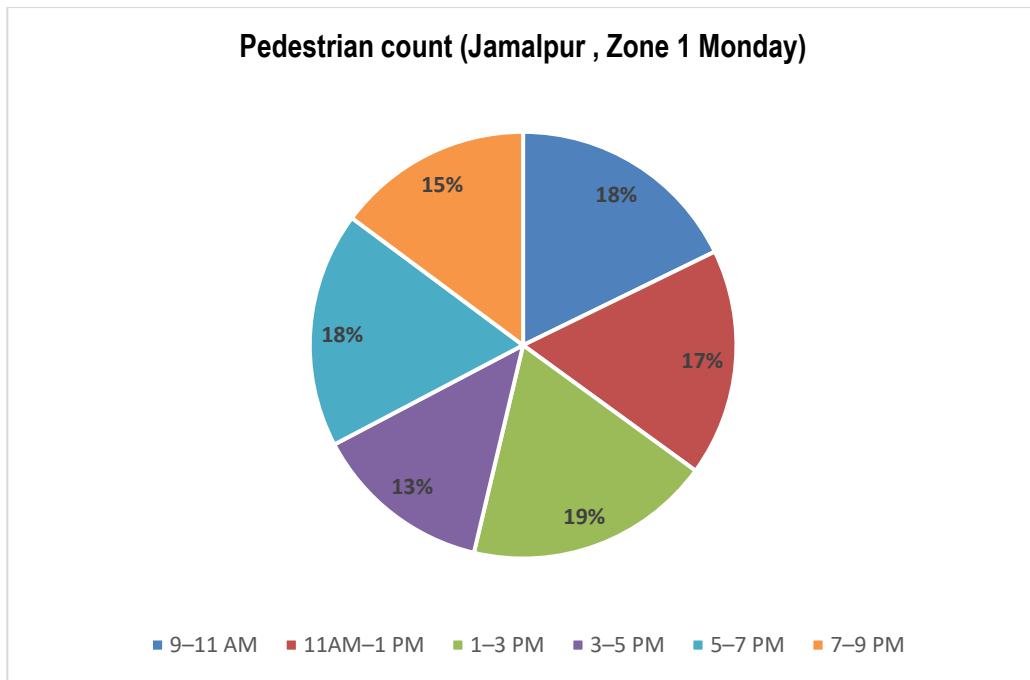


Figure 22 Pedestrian Count Percentage Jamalpur (Source: Author)

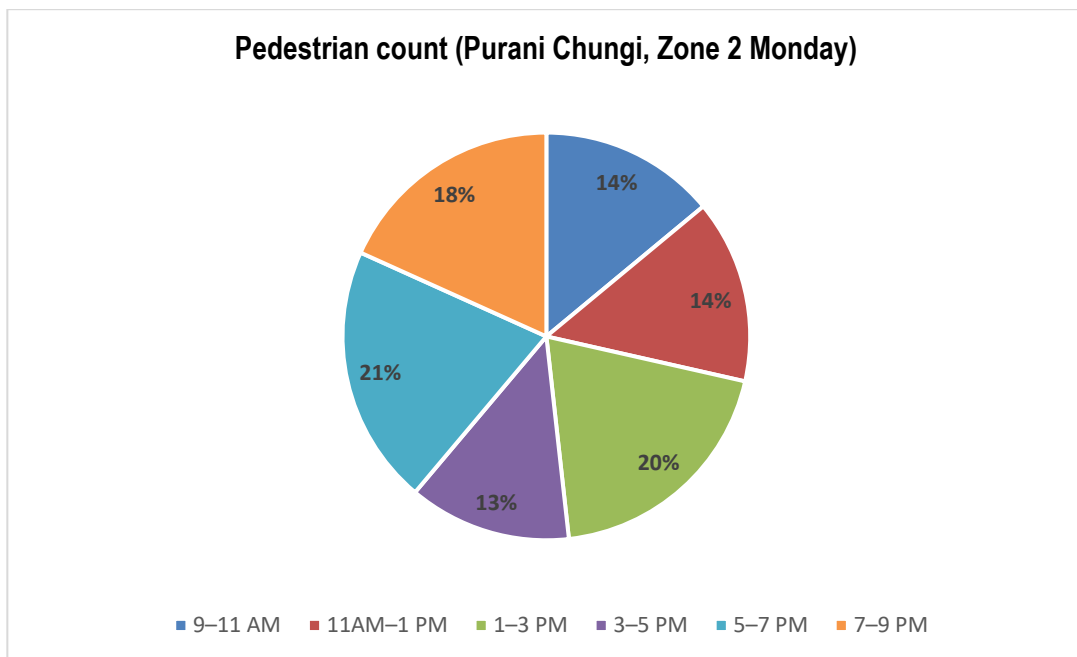


Figure 23 Pedestrian count Pedestrian Purani Chungi (Source: Author)

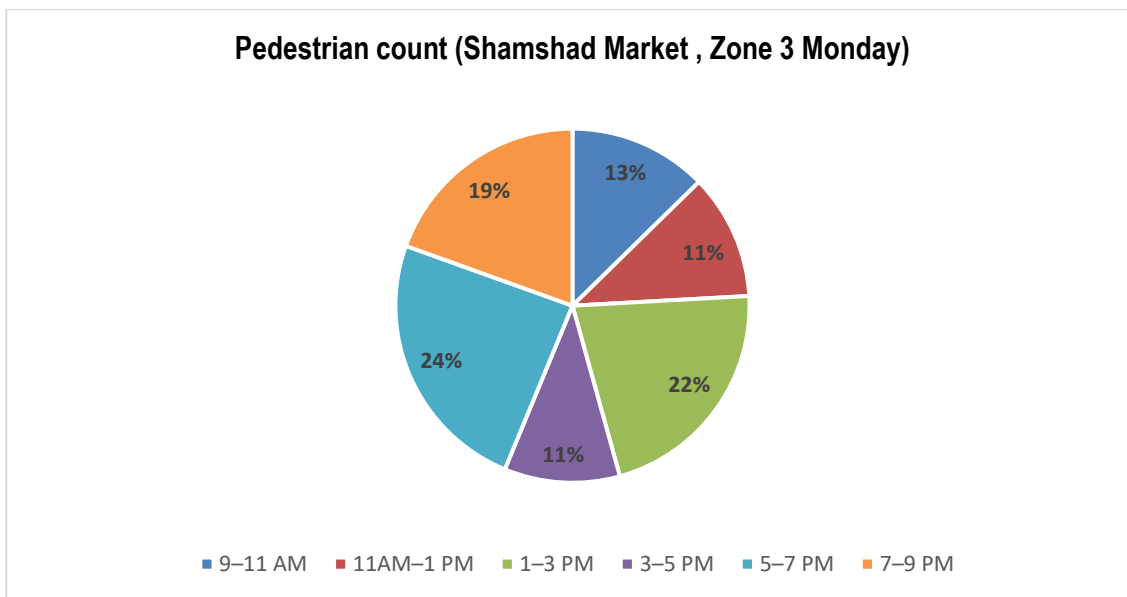


Figure 24 Pedestrian Count percentage Shamshad Market (Source: Author)

The pedestrian traffic patterns at Jamalpur, Purani Chungi, and Shamshad Market are similar, with peak hours during the afternoon and early evening. Jamalpur experiences the highest foot traffic between 1–3 PM (18.69%) and 5–7 PM (17.87%), while Purani Chungi Junction experiences moderate traffic in mornings (9–11 AM (17.77%) and 11 AM–1 PM (17.23%)), and minimums during 3–5 PM (13.58%). Shamshad Market has the highest evening traffic (24.24%), followed by 1–3 PM (21.57%) and 7–9 PM (19.51%). Mornings are less active (12.67%) and less active (11.45%), and the least is 3–5 PM (10.56%).

4.2 Pedestrian-vendor Interaction

On weekdays (Monday) and weekends (Sunday), the data shows clear trends in the interactions between pedestrians and vendors at three different locations: Jamalpur Junction, Purani Chungi Junction, and Shamshad Market.

Table 4 Pedestrian Interaction % per day across the study zones (Source: Author)

Study Zone	Total Pedestrian Vendor Interaction % per Day
Jamalpur	4.60
Purani Chungi	4.50
Shamshad Market	4.70

Weekends see lower foot traffic but higher evening engagement, especially at Purani Chungi

(7.9% at 7–9 PM) and Jamalpur (8.0% at 7–9 PM), while weekdays see higher pedestrian traffic, with Shamshad Market showing the highest interaction rate (5.7% overall) and peaking at 5.8% during 5–7 PM. Evenings (5–9 PM) consistently emerge as the highest time for contacts across all locations. While Jamalpur and Purani Chungi exhibit greater weekend potential, Shamshad Market's supremacy during the week contrasts with its noticeably poorer weekend performance.

5. Discussion

The multi-dimensional survey along Anoopshahar Road, including information from pedestrians, street vendors, commuters, and drivers, points to this urban artery's complex but interconnected dynamics. Pedestrians talked about walking as an available mode of transportation, particularly for short distances, but experienced recurring difficulties such as narrow or blocked footpaths, absence of secure crossings, and informal vending congestion. At the same time, pedestrian count data verifies peak-hour congestion, demonstrating intense demand for better pedestrian facilities. Street vendors, as evidenced in their survey answers and interaction patterns, select locations by visibility and foot traffic, commonly occupying informal or unauthorized areas. Though they make valuable contributions to the local economy and commuter convenience, their presence often interferes with pedestrian space, which leads to conflict between mobility and livelihood.

Equally, both vehicle counts and driver survey statistics show significant congestion at rush hour, with drivers blaming pedestrian unpredictability and vending-related incursions for causing traffic flow problems. Apart from congestion, both pedestrians and vendors also report a preference for closeness—vendors enjoy high passerby numbers, and pedestrians appreciate the ease of access to goods, implying a symbiotic relationship that can be managed better than erased. These findings warrant context-specific city interventions. Redevelopment of Anoopshahar Road in the future must involve wider, unbroken pedestrian pathways and designated vending areas with necessary facilities such as access to water, shelter, and trash cans. Raised crossings, roadway markings, and traffic calming interventions such as reduced vehicle lanes and signalized intersections can enhance safety and regulate interactions better.

Governance structures also need to adapt to accommodate these shifts via vendor licensing systems, geographic monitoring, and collaborative regulation with local associations and municipal authorities. Technology can also assist in the management of this dynamic street space via real-time footfall and traffic data, guiding responsive planning and emergency intervention. Above all, the redesign process needs to involve all stakeholders, including commuters, vendors, and residents, in participatory, inclusive processes to create durable solutions. With such holistic physical, policy, and participatory strategies, Anoopshahar Road has the potential to become a safer, more equitable, and lively urban street that serves and expresses the diverse needs of its regular users.

6. Conclusion

Street vending contributes significantly to urban economies by providing affordable products and services, creating jobs for the urban poor, and enlivening public space, as highlighted in the literature. Far from enjoying the socio-economic significance of their contribution, street vendors in Indian cities such as Aligarh generally work in insecure situations, subject to regulatory insecurity, poor infrastructure, and constant eviction. The literature emphasizes that although street vendors are bringing vibrancy and convenience to urban life, their unregulated existence tends to impede pedestrian flow, fuel traffic, and generate conflicts in public urban spaces. Acts such as the Street Vendors (Protection of Livelihood and Regulation of Street Vending) Act, 2014, attempt to find a balance by protecting livelihood but enhancing spatial order through licensed vending areas and licensing schemes. Drawing on these policy and theory findings, the present research employed a quantitative research approach to measure the contribution and effect of street vendors on urban mobility along a 2.5 km section of Anoopshahar Road in Aligarh. Primary data were gathered through traffic and pedestrian count surveys, manual observation, videography, GIS mapping, and structured interviews with five groups of stakeholders, such as street vendors, commuters, and drivers. Traffic flows were compared with IRC guidelines and PCU values to calculate V/C ratios and LOS, while vendors were categorized by type and product. It was found that informal vending is highly localized in areas of high foot traffic around institutions and transport hubs and tends to spill over into pedestrian spaces and prolong vehicular travel times. Stakeholder comments did, however, also describe the irreplaceable convenience vendors offer and their being integrated into local habits. The conversation of these results sheds light on the twin nature of

street vending as an economic necessity and a spatial issue and suggests that any planning for integrative work must neither exclude vendors nor compromise urban mobility. Therefore, the research concludes that any successful urban mobility plan should include informal vendors via participatory planning, spatially allocated places for vending, and facilitating infrastructure such as dustbins, shade, and access to water. Regulatory systems need to transition from enforced compliance to proactive inclusion, enabled by near-real-time data and cross-sector collaboration. Through such inclusive measures, roads like Anoopshahar Road can become fair, efficient, and lively city corridors catering to movement and livelihood.

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