



A Study on Observation of Rapido-Based Mobility Choices in Tier 2 Cities with Special Reference to Tirupati City

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Abstract-- this study examines the emerging role of rapido as a platform-based mobility solution in tirupati, a rapidly growing tier-2 city. Using a convenience sampling approach and case-based observational analysis, the research explores usage patterns, perceptions, and determinants influencing adoption across diverse income and occupational groups. The findings reveal that rapido serves both necessity-driven and convenience-driven users by offering affordable, accessible, and time-efficient transport services. The study highlights its significant contribution to end-to-end travel and last-mile connectivity, effectively addressing gaps such as inconvenient routes and long waiting times in traditional transport systems. While the platform demonstrates strong acceptance, concerns related to safety and inclusivity persist. The study concludes that app-based bike taxi services play a crucial role in enhancing urban mobility efficiency and promoting flexible, technology-driven transportation solutions in developing urban contexts.

Keywords-- Urban Mobility, Rapido, Tirupati, Last-Mile Connectivity, Platform-Based Transport, Convenience Sampling, User Behavior, Time Efficiency, Affordability, Inclusive Mobility.

I. BACKGROUND OF URBAN MOBILITY

Urban mobility refers to the movement of people and goods within urban areas through various modes of transportation. It is a critical component of urban development, influencing economic productivity, accessibility to services, and the overall quality of life. Efficient urban mobility systems enable individuals to commute for work, education, healthcare, and other daily activities in a timely and cost-effective manner.

Evolution of Urban Transport Systems

Urban mobility has undergone a significant transformation over time. Traditionally, transportation systems relied heavily on walking, cycling, and public transit such as buses and railways. With rapid urbanization and economic growth, there has been a shift towards private vehicle ownership, particularly two-wheelers and cars. In recent years, technological advancements have led to the emergence of app-based mobility services, marking a transition from ownership-based to service-based transport models.

Challenges in Urban Mobility

Urban areas, especially in developing countries, face several mobility-related challenges. These include traffic congestion, inadequate public transport infrastructure, increasing travel costs, and environmental concerns such as air pollution. One of the most critical issues is the lack of efficient last-mile connectivity, which creates a gap between major transport hubs and final destinations, leading to inconvenience and increased travel time for commuters.

Importance of Last-Mile Connectivity

Last-mile connectivity plays a vital role in enhancing the effectiveness of urban transport systems. It refers to the final segment of a journey from a transport node, such as a bus stop or railway station, to the destination. Inefficient last-mile connectivity often discourages the use of public transport. Therefore, improving this aspect is essential for creating seamless and integrated mobility systems.

Emergence of App-Based Mobility Services

The rise of digital technology and smartphone penetration has facilitated the growth of app-based mobility platforms. These services provide on-demand, flexible, and door-to-door transport options, addressing many of the limitations of traditional transport systems. They have gained popularity due to their affordability, convenience, and ability to offer personalized travel experiences.

Urban Mobility in Tier-2 and Tier-3 Cities

In smaller cities such as Tirupati, urban mobility presents unique challenges and opportunities. Public transport systems are often limited, and infrastructure constraints make traditional transport less efficient. In such contexts, app-based services play a crucial role in bridging mobility gaps by offering accessible and cost-effective solutions for short-distance and last-mile travel.

II. GROWTH OF PLATFORM-BASED TRANSPORT SERVICES

The rapid expansion of platform-based transport services represents a significant shift in the urban mobility landscape.



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Driven by advancements in digital technology, widespread smartphone adoption, and increasing internet penetration, these platforms have transformed traditional modes of transportation into on-demand, service-oriented systems. By leveraging mobile applications and algorithm-based matching, platform-based services efficiently connect riders with drivers, thereby reducing search costs, wait times, and operational inefficiencies. This transition reflects a broader movement from ownership-based mobility to shared and access-based transportation models.

In recent years, platform-based transport services have gained substantial traction in developing economies, particularly in urban and semi-urban regions. Factors such as rising urbanization, inadequate public transport infrastructure, and the growing need for flexible commuting options have accelerated their adoption. These services offer multiple advantages, including affordability, convenience, and door-to-door connectivity, which make them highly attractive to a diverse user base. Furthermore, the integration of digital payment systems and real-time tracking features has enhanced user experience and trust, contributing to sustained growth and widespread acceptance.

Additionally, platform-based mobility services have played a crucial role in the expansion of the gig economy by generating flexible employment opportunities. Individuals can participate as service providers with relatively low entry barriers, thereby contributing to income generation and economic inclusion. However, this growth also raises concerns related to regulatory frameworks, worker security, and service standardization. Despite these challenges, platform-based transport services continue to evolve and are increasingly recognized as an essential component of modern urban mobility systems, particularly in addressing last-mile connectivity and improving overall transport efficiency.

Need For Inclusive Mobility Solutions

Inclusive mobility solutions are essential for ensuring equitable access to transportation across all sections of society. In many urban and semi-urban areas, mobility systems often fail to adequately serve economically weaker sections, elderly individuals, women, and those without access to private vehicles. Limitations in public transport infrastructure, coupled with issues such as fixed routes, overcrowding, and lack of last-mile connectivity, create significant barriers to mobility. As a result, individuals may face difficulties in accessing employment, education, healthcare, and other essential services.

Inclusive mobility aims to address these disparities by providing affordable, accessible, and user-friendly transport options that cater to diverse needs and socio-economic conditions.

Furthermore, the growing complexity of urban environments necessitates flexible and adaptive transport systems that go beyond traditional models. Inclusive mobility solutions emphasize door-to-door service, safety, time efficiency, and multiple payment options to accommodate varying levels of digital literacy and financial capability. By integrating technology-driven platforms with existing transport networks, such solutions can enhance connectivity and reduce dependence on private vehicle ownership. Ultimately, promoting inclusive mobility contributes not only to social equity but also to economic development and sustainable urban growth by enabling broader participation in urban life.

Origin Of Rapido Services

Rapido is an app-based bike taxi service that originated in India with the objective of addressing the growing challenges of urban mobility, particularly last-mile connectivity and traffic congestion. The platform was founded in 2015 by entrepreneurs Aravind Sanka, Pavan Guntupalli, and Rishikesh SR. Initially launched as “theKarrier,” the service focused on logistics and parcel delivery. However, recognizing the increasing demand for quick, affordable, and flexible personal transport, the founders repositioned the platform as a bike taxi service under the name Rapido.

The evolution of Rapido was driven by the need to provide efficient solutions to urban transport issues such as traffic congestion, high commuting costs, and inadequate last-mile connectivity. By utilizing two-wheelers instead of traditional four-wheeler taxis, Rapido was able to offer faster and more economical rides, particularly for short distances. The platform leverages mobile application technology to connect riders with nearby “captains” (drivers), enabling real-time booking, route tracking, and digital payments. This model significantly reduces waiting time and enhances user convenience.

Over time, Rapido has expanded its services across multiple cities in India, including Tier-2 and Tier-3 urban areas, where public transport infrastructure is often limited. The platform has also contributed to the growth of the gig economy by providing flexible earning opportunities for individuals willing to operate as bike taxi drivers. Despite facing regulatory challenges in certain states, Rapido continues to evolve by adapting its service offerings and focusing on safety, affordability, and accessibility.



Today, it stands as a prominent example of how platform-based mobility services can transform urban transportation by making it more inclusive, efficient, and user-centric.

Significance of the Study

The present study holds significant importance in the context of rapidly evolving urban mobility systems. With the increasing dependence on app-based transport services such as Rapido, it becomes essential to understand how these platforms cater to diverse socio-economic groups. This study provides valuable insights into the role of such services in addressing key mobility challenges, including affordability, accessibility, and last-mile connectivity. By focusing on real-time user experiences, the research highlights how platform-based transport solutions bridge gaps left by traditional transport systems.

Furthermore, the study contributes to the understanding of behavioral patterns associated with mobility choices across different income and occupational segments. It identifies how factors such as cost, convenience, safety, and time efficiency influence the adoption of Rapido. This is particularly relevant for policymakers, urban planners, and service providers, as it helps in designing inclusive and user-centric mobility solutions. The findings also emphasize the importance of flexible payment systems and personalized transport services in enhancing user satisfaction.

Additionally, the study is significant in the context of the gig economy, as it showcases how platforms like Rapido create employment opportunities while simultaneously improving urban transport efficiency. It also sheds light on the adaptability of such services in both urban and semi-urban settings, making them crucial for sustainable mobility development. Overall, the study provides a comprehensive understanding of the growing relevance of platform-based transport services and their impact on modern commuting patterns.

Objectives of the Study

- To examine the usage patterns of Rapido across different socio-economic and occupational groups (focus on how various users adopt the service)
- To analyze the key factors influencing the adoption of Rapido, including affordability, accessibility, time efficiency, and safety (identifies decision-making drivers)
- To evaluate the role of Rapido in enhancing last-mile connectivity and addressing gaps in traditional urban transport systems (links with urban mobility issues)

III. RESEARCH METHODOLOGY

Study Area: Tirupati

Tirupati, located in the southern region of Andhra Pradesh, is one of the rapidly developing Tier-2 cities in India. The city has an estimated population of approximately 0.9 to 1.0 million and has experienced notable urban and economic growth in recent years.

A key characteristic of Tirupati is its significant youth population, largely influenced by the presence of multiple higher educational institutions. The city hosts several prominent universities, including Sri Venkateswara University, Sri Venkateswara Vedic University, Sri Venkateswara Agricultural University, along with private institutions such as Mohan Babu University. In total, Tirupati accommodates around nine universities, contributing to a diverse and dynamic academic environment.

In addition to its resident population, the city experiences a substantial floating population estimated at 60,000–70,000 individuals per day. This includes pilgrims visiting the renowned Tirumala Venkateswara Temple, as well as business professionals and political visitors. This continuous influx significantly influences the city's economic activity, infrastructure demand, and overall urban dynamics.

Given its relatively compact geographical area, Tirupati has historically relied on public transportation as the primary mode of mobility. Until about five years ago, bus services operated by Andhra Pradesh State Road Transport Corporation played a central role in urban commuting. Major routes connecting Renigunta and Chandragiri provided extensive coverage, enabling access to most parts of the city with minimal walking distance.

Over time, shared auto-rickshaw services emerged as an important supplement to the public transport system, enhancing last-mile connectivity and offering greater flexibility to commuters. More recently, app-based mobility platforms such as Rapido have gained widespread acceptance across different socio-economic groups. Their growing popularity can be attributed to affordability, convenience, and the availability of customized travel options.

Overall, Tirupati presents a dynamic urban transport landscape characterized by a transition from traditional public transit systems to more flexible, technology-driven mobility solutions. This evolution, combined with its educational prominence and high influx of visitors, makes Tirupati a relevant and compelling case for urban and transportation-related research.

Sampling Method

The present study adopts a convenience sampling method to collect data from respondents in Tirupati. Convenience sampling is chosen due to its practicality and suitability for capturing responses from readily accessible participants across different socio-economic groups within the study area.

The total population considered for the study comprises 200 respondents, categorized into four groups: students (40), private employees (80), business people (50), and Tirupati visitors (30). To determine an appropriate sample size from this finite population, the standard formula for finite population sampling was applied:

Category of respondents	Select Total Population
Students	40
Private employees	80
Business people	50
Tirupati visitors	30
Total	200

Sample size is being determined by using the formula of finite population

$$n = \frac{N}{1 + N(e^2)}$$

where n represents the required sample size, N is the total population (200), and e is the margin of error, taken as 5% (0.05). Based on this calculation, the sample size was derived as approximately 133 respondents, representing about 66% of the total population.

The calculated sample size was then proportionately allocated across the different respondent categories to ensure balanced representation. Accordingly, the sample includes 27 students, 52 private employees, 33 business people, and 21 Tirupati visitors, totaling 133 respondents.

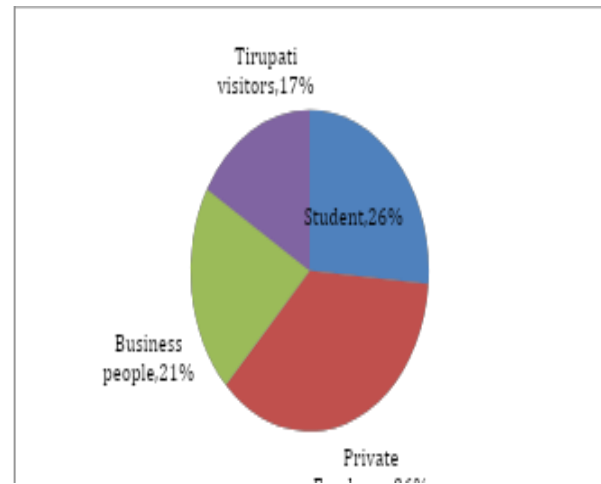
This structured yet flexible approach ensures that the study captures diverse perspectives while maintaining feasibility in data collection.

The use of convenience sampling, combined with proportionate representation, allows for meaningful insights into the study area while accommodating practical constraints such as time and accessibility.

IV. DATA ANALYSIS AND INTERPRETATIONS

Table:1
Category of Respondents

Category of Respondents	No. of Respondents	Percentage of respondents
Student	35	26%
Private Employee	48	36%
Business people	28	21%
Tirupati visitors	22	17%
Total	133	100%



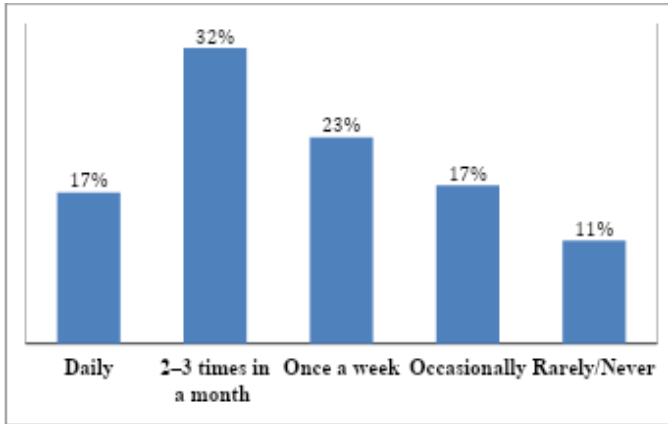
Graph:1 Category of Respondents

Interpretations:

From the above table, the respondent distribution in Tirupati shows private employees (36%) as the largest group, followed by students (26%), business people (21%), and Tirupati visitors (17%), indicating balanced representation across all categories.

Table:2
Frequency of Rapido usage

Responses	Number of Respondents	Percentage of Respondents
Daily	22	17%
2-3 times in a month	43	32%
Once a week	30	23%
Occasionally	23	17%
Rarely/Never	15	11%
Total	133	100%



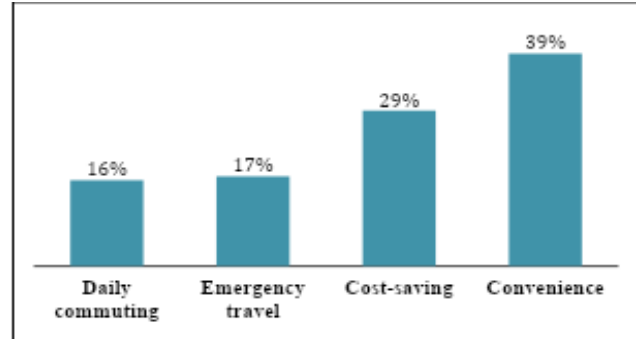
Graph :2 Frequency of Rapido usage

Interpretation:

From the above table, respondents in Tirupati most commonly use the service 2-3 times a month (32%), followed by once a week (23%), while daily and occasional usage are equal (17% each), and rarely/never accounts for 11%.

Table:3
Purpose of using Rapido

Responses	Number of Respondents	Percentage of respondents
Daily commuting	21	16%
Emergency travel	22	17%
Cost-saving	38	29%
Convenience	52	39%
Total	133	100%



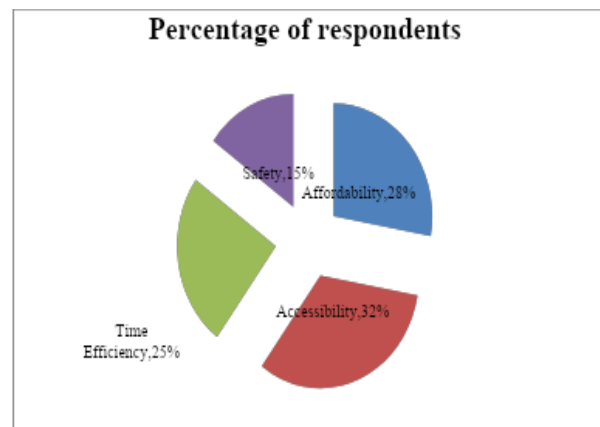
Graph :3 Purpose of using Rapido

Interpretation:

From the above table, respondents in Tirupati primarily use Rapido for convenience (39%), followed by cost-saving (29%), while emergency travel (17%) and daily commuting (16%) account for comparatively smaller shares.

Table:4
Important factor influences on Rapido service

Responses	Number of Respondents	Percentage of respondents
Affordability	37	28%
Accessibility	43	32%
Time Efficiency	33	25%
Safety	20	15%
Total	133	100%



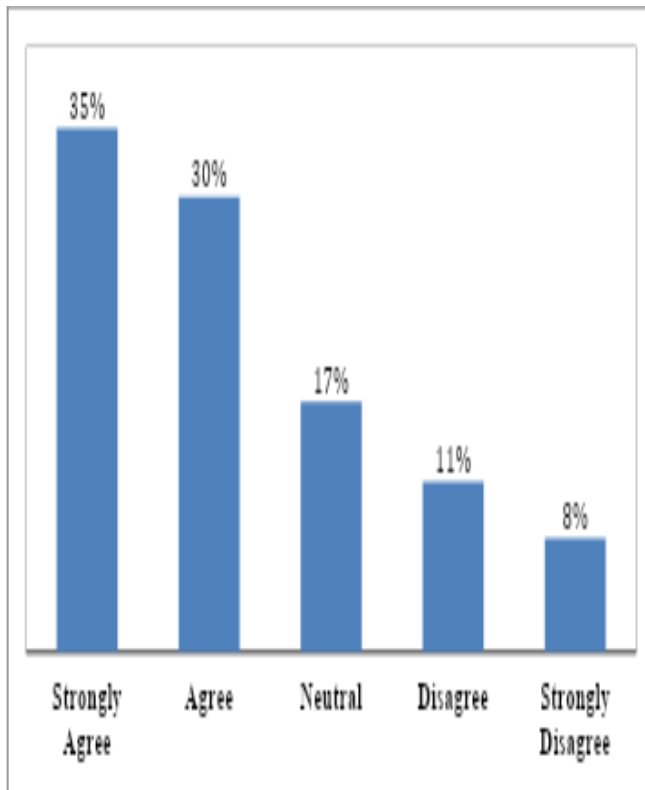
Graph:4 Important factor influence on Rapido service

Interpretation:

From the above table, respondents in Tirupati identify accessibility (32%) as the most influential factor for using Rapido, followed by affordability (28%) and time efficiency (25%), while safety (15%) is considered comparatively less important.

Table:5
Perception – Rapido is Affordable

Responses	Number of Respondents	Percentage of respondents
Strongly Agree	46	35%
Agree	40	30%
Neutral	22	17%
Disagree	15	11%
Strongly Disagree	10	8%
Total	133	100%



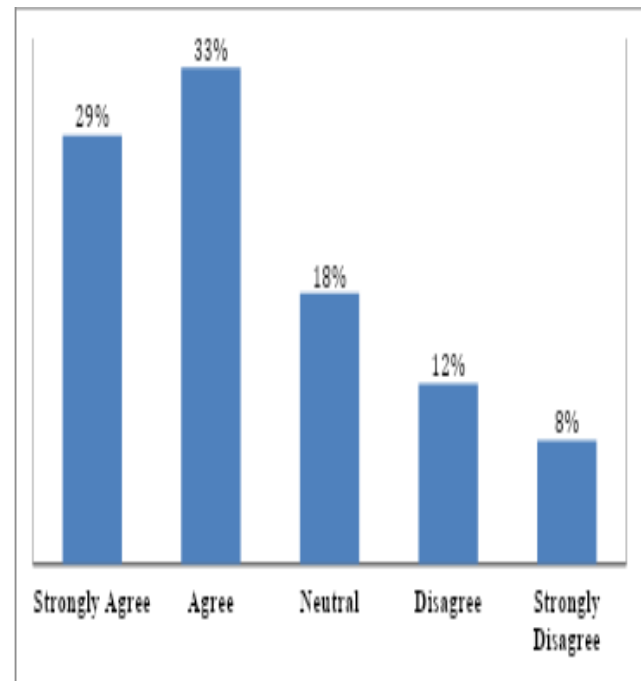
Graph :5 Perception – Rapido is Affordable

Interpretation:

From the above table, respondents in Tirupati show a positive perception, with strongly agree (35%) and agree (30%) forming the majority, while neutral (17%), disagree (11%), and strongly disagree (8%) represent comparatively smaller proportions.

Table:6
Perception – Rapido Saves Travel Time

Responses	Number of Respondents	Percentage of respondents
Strongly Agree	38	29%
Agree	44	33%
Neutral	24	18%
Disagree	16	12%
Strongly Disagree	11	8%
Total	133	100%



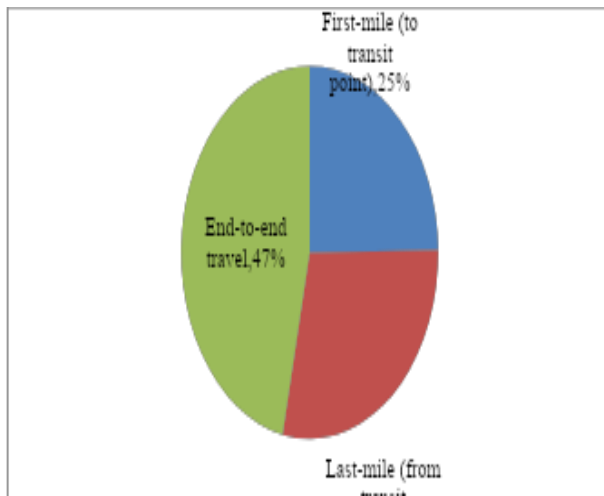
Graph:6 Perception – Rapido Saves Travel Time

Interpretation:

From the above table, respondents in Tirupati largely express agreement, with agree (33%) and strongly agree (29%) forming the majority, while neutral (18%), disagree (12%), and strongly disagree (8%) constitute smaller proportions.

Table:7
Usage of Rapido in Travel Journey

Responses	No. of Respondents	% of respondents
First-mile (to transit point)	33	25%
Last-mile (from transit point)	38	29%
End-to-end travel	62	47%
Total	133	100%



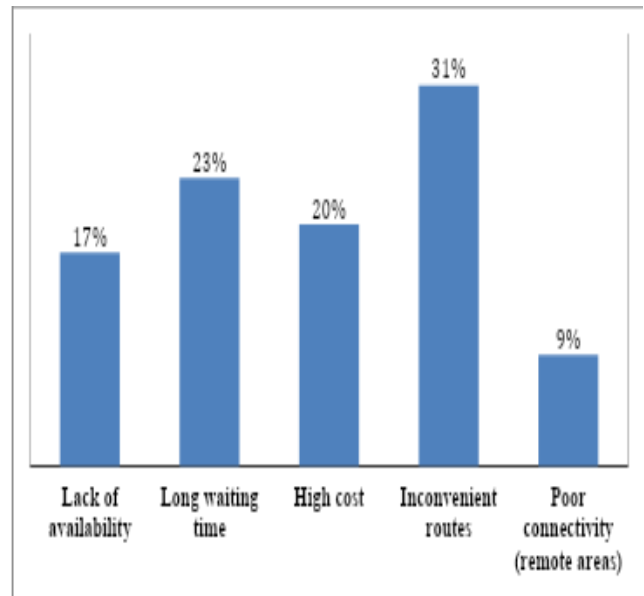
Graph :7 Usage of Rapido in Travel Journey

Interpretation:

From the above table, respondents in Tirupati primarily use Rapido for end-to-end travel (47%), followed by last-mile connectivity (29%) and first-mile access (25%), indicating its strong role in complete travel journeys.

Table:8
Gap in Traditional Transport Addressed by Rapido

Responses	Number of Respondents	Percentage of respondents
Lack of availability	23	17%
Long waiting time	31	23%
High cost	26	20%
Inconvenient routes	41	31%
Poor connectivity (remote areas)	12	9%
Total	133	100%



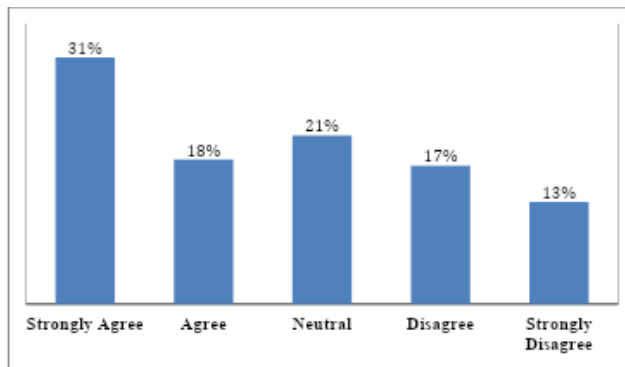
Graph :8 Gap in Traditional Transport Addressed by Rapido

Interpretation:

From the above table, respondents in Tirupati indicate that inconvenient routes (31%) are the major gap addressed by Rapido, followed by long waiting time (23%) and high cost (20%), while lack of availability (17%) and poor connectivity (9%) are less significant.

Table:9
Rapido is Accessible to All Types of Users

Responses	Number of Respondents	Percentage of respondents
Strongly Agree	41	31%
Agree	24	18%
Neutral	28	21%
Disagree	23	17%
Strongly Disagree	17	13%
Total	133	100%



Graph :9 Rapido is Accessible to All Types of Users

Interpretation :

From the above table, respondents in Tirupati show mixed opinions on Rapido accessibility, with strongly agree (31%) leading, followed by neutral (21%) and agree (18%), while disagree (17%) and strongly disagree (13%) indicate notable concerns among users.

Case-Based Observations and Analysis

Case-based observations and analysis in Tirupati provide practical insights into user behavior, travel patterns, and mobility challenges. By examining real-life experiences with Rapido, this approach helps evaluate service efficiency, accessibility, user satisfaction, and identify gaps in existing urban transportation systems for better planning.

Case 1: Lower Middle-Class Worker (Necessity-Based Usage)

Profile

The respondent is a middle-aged individual (above 55 years) employed as a night watchman. He belongs to a lower middle-class household consisting of his spouse, who works as a cleaning staff member in a private hospital, and a college-going daughter. The family does not own a two-wheeler or any personal mode of transportation. As a result, he depends on Rapido for his daily commute, typically leaving for work at around 6:30 PM.

Observations

- The Rapido rider consistently arrives at the exact pickup location, eliminating the need for the user to walk.
- The respondent prefers cash-based payment, often carrying small denominations or coins.
- The respondent appears comfortable and relaxed while waiting for the rider, indicating familiarity with the service.

Interpretation

The observations suggest that Rapido serves as a **necessity-driven mobility solution** for the respondent. The absence of personal transport and limited income make affordability a key factor influencing usage. The preference for cash payments reflects lower digital financial inclusion, while the user's comfort level indicates trust and habitual reliance on the platform. Overall, Rapido fulfills essential commuting needs by providing accessible, low-cost, and door-to-door transport service.

Case 2: Working Professional (Convenience-Based Usage)

Profile

The respondent is an educated female professional employed in a small software company. She resides away from her hometown and does not own a personal vehicle. She relies on Rapido for her daily commute, with riders typically arriving at her pickup point between 8:45 AM and 9:00 AM.

Observations

- The respondent experiences minimal or no waiting time, as riders arrive promptly.



- She demonstrates a sense of safety and confidence while boarding the ride.
- The payment method is digital, using mobile-based transactions with OTP verification.

Interpretation

The observations indicate that Rapido is used as a **convenience-driven mobility solution**. The respondent values time efficiency, reliability, and safety in her daily commute. The adoption of digital payment methods reflects higher digital literacy and ease of transaction. Rapido, in this case, enhances commuting efficiency and supports independent mobility for working professionals.

Case 3: Lecturer (Emergency Usage)

Profile

The respondent is a private college lecturer residing approximately 9 kilometres from the workplace. Although he owns a two-wheeler, he faced a mechanical issue on a particular day and was unable to repair it despite multiple attempts.

Observations

- The respondent booked Rapido immediately after the vehicle breakdown.
- Rapido was chosen over auto-rickshaws due to lower cost.
- The service enabled him to reach the workplace on time despite the unexpected situation.

Interpretation

This case demonstrates that Rapido functions as an **instant contingency or emergency mobility solution**. It provides a reliable alternative during unforeseen disruptions such as vehicle failure. The preference over autos highlights its cost advantage, even among individuals with access to personal vehicles.

Case 4: Retired Rural User (Planned Last-Mile Connectivity)

Profile

The respondent is a retired individual residing in a rural area who frequently visits a hospital for medical consultations. He typically travels by bus to the nearest bus stand and then uses Rapido to reach the hospital.

Observations

- The respondent pre-plans the use of Rapido after reaching the bus stand.
- He prefers Rapido over auto-rickshaws due to lower cost.

- He chooses Rapido instead of local buses despite lower fares, due to time-saving and direct connectivity.

Interpretation

The observations indicate that Rapido serves as a **planned last-mile connectivity solution**. The respondent integrates it into a multi-modal transport system (bus + Rapido). The preference for Rapido over cheaper bus options reflects the importance of time efficiency and convenience over minimal cost.

Case 5: Zonal Sales Manager (Professional Mobility)

Profile

The respondent is a marketing professional working as a zonal sales manager. His job involves frequent travel across multiple towns. Despite receiving travel allowances (TA/DA), he relies on Rapido for intra-city travel after reaching destinations via bus or train.

Observations

- The respondent regularly uses Rapido for local travel in different towns.
- He prefers individual rides for comfort and flexibility.
- Rapido is chosen despite availability of reimbursable travel expenses.

Interpretation

This case highlights Rapido as a **professional mobility solution** driven by convenience and efficiency. The respondent's preference indicates that user choice is influenced not only by cost but also by comfort, flexibility, and time-saving benefits. Rapido supports seamless mobility for professionals with dynamic travel requirements.

Findings

1. Rapido demonstrates substantial adoption across diverse respondent categories, with a higher concentration among private employees and students, indicating its relevance among the working and youth population.
2. The frequency of usage is predominantly moderate, with the majority of respondents utilizing the service 2–3 times per month, suggesting it serves as a supplementary rather than primary mode of transport.
3. Convenience and cost-effectiveness emerge as the most significant determinants influencing usage, underscoring the platform's alignment with user expectations for economical and flexible mobility solutions.



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4. Accessibility and time efficiency are identified as critical influencing factors, reflecting the growing demand for quick, reliable, and easily available transportation services in urban settings.
5. The service exhibits a strong inclination toward end-to-end travel usage, indicating its evolution beyond a mere last-mile connectivity solution into a comprehensive urban mobility option.
6. Rapido effectively addresses key deficiencies in traditional transport systems—particularly inconvenient routes and prolonged waiting times—although concerns regarding safety and universal accessibility persist among a segment of users.

V. CONCLUSION

The study conducted in Tirupati highlights the growing significance of app-based mobility solutions such as Rapido in transforming urban transportation patterns. The findings indicate that Rapido is widely adopted, particularly among students and private employees, due to its affordability, convenience, and time efficiency.

While the service is primarily used on a moderate basis, its increasing role in end-to-end travel reflects a shift in user preferences toward flexible and technology-driven transport options.

Furthermore, Rapido effectively addresses key gaps in traditional transport systems, including inconvenient routes and long waiting times. However, concerns related to safety and universal accessibility suggest the need for further improvements. Overall, the study concludes that app-based bike taxi services have strong potential to complement existing public transport systems and contribute to more efficient urban mobility.

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