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Assessment of Public Transport Efficiency for Zero Hour: A Case Study of Twin City

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Abstract: ***This thesis examines the effectiveness of public transportation after midnight with an emphasis on cities with substantial nighttime activity. With consideration for variables including frequency, safety, accessibility, and user satisfaction, the study attempts to evaluate the operational effectiveness, coverage, and dependability of nighttime public transportation services. The research identifies major obstacles and opportunities for improving the efficiency of nighttime transportation through a mixed-methods approach that includes quantitative data analysis of service schedules and ridership statistics, as well as qualitative surveys and interviews with passengers and transit operators. Best practices and comparative insights are offered via case studies from large cities across the globe. Increased service frequency, improved safety precautions, an analysis of the wait time, and suggested fare prices are among the recommendations. By addressing the sometimes disregarded issue of nocturnal public transportation and offering workable strategies to build more inclusive and effective 24-hour public transportation networks, this study adds to the body of knowledge in urban transport planning.***
Keywords: Public transport, Night hour, Midnight, Zero hour, Feasibility, Accessibility

I. INTRODUCTION

Numerous cities are also active at night. Even though things could move more slowly than during the day, cities frequently provide a variety of services and events that run late into the evening. Restaurants, transportation hubs, nightclubs, emergency services, and specific companies that serve nocturnal activities are a few examples of these. Furthermore, several cities are well-known for their exciting nightlife and cultural activities, which mostly take place in the late evening and early morning hours. Public transportation options are scarce or nonexistent, and the cost of moving about in cities has gone up due to factors including a higher reliance on auto rickshaws and taxis. Public transportation operates late into the night to cater to a variety of user groups, such as travelers arriving or departing at unusual hours and night shift workers. Public transportation must become more effective and dependable as cities continue to grow and their populations rise. A significant body of study has been done on the effectiveness and efficiency of public transportation during peak hours, but less is known about how well it performs during off-peak hours, especially after midnight.

II. NEED OF THE STUDY

The aim of this topic is to assess the effectiveness, reliability, and overall performance of public transportation systems during late night hours for the following reasons:

1) To evaluate public transportation's dependability and accessibility for late-night commuters from major transportation hubs.
2) To ensure a customer-centric approach to service improvement, by collecting and evaluating customer feedback on late-night public transportation services in order to pinpoint problem areas and potential improvement areas.
3) To evaluate the revenue feasibility for night time transportation.
4) To evaluate and examine the safety protocols implemented for both passengers and operators during late night hours, and pinpoint areas that require enhancement to guarantee a secure travel atmosphere.

Evaluating public transportation's effectiveness around midnight is important for a number of reasons:

a) Providing Assistance to Night Workers and Shift Workers

For affordable and secure transportation, these people depend on public transportation. Effective public transportation options at night are crucial for:

Economic Productivity: Ensuring a dependable commute for employees to and from work promotes economic productivity and lowers absenteeism resulting from transportation-related problems.

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Employment Accessibility: By offering effective transportation choices, occupations can become more accessible to a larger group of people, especially those without access to private automobiles.

b) Increasing the Night-Time Economy

Effective public transportation helps the evening economy by:

Encouraging Participation: More individuals engaging in nighttime activities is facilitated by dependable transportation services, which benefits neighborhood establishments including eateries, theaters, and clubs.

Ensuring Safety: Taking public transportation is a safer option than driving while intoxicated, which lowers the number of accidents that occur on the roads at night.

c) Encouraging Social Equity and Accessibility

Regardless of the time of day, ensuring that all city dwellers have access to the city's resources and opportunities depends on effective late-night public transportation. Individuals with lower incomes, students, and senior citizens frequently rely more heavily on public transportation and derive substantial advantages from dependable late-night services. Ensuring that public transportation is accessible and effective around-the-clock contributes to the development of a more inclusive city in which all people have an equal chance to move around freely and obtain basic services.

As metro project is proposed for Bhubaneswar, Cuttack, Khordha and Puri, with time these areas will be running after zero hour. The need and dependency on the public transport will gradually increase.

here is no MO bus service available after 10pm. This caused people to go by other means which becomes either costly or unsafe for use.

People arriving to the twin city Cuttack and Bhubaneswar after zero hour face many challenges regarding the public transportation system.

III. RESEARCH METHODOLOGY

The following steps are followed in this study:

1) After doing the background study and issues identification aim and objective was finalized.

2) Literature review was done by doing a thorough analysis of previous research and written works concerning late-night public transportation systems. Findings were done relating to the main variables affecting passenger behavior and service effectiveness after off-peak hours. Giving articles with empirical data or case studies from various cities or regions a higher priority. Including case studies that talk about how public transportation works, particularly late at night.

3) Data collection was done by primary and secondary data collection method. Primary data was collected by noting the current situation and making field observations. In-person observations were made at important transit hubs (subway stations and bus stops) at night hour. Number of passengers, the frequency of services, and the problems they are having were noted down. Questionnaires and Surveys were done to get feedback on the effectiveness of services after midnight from people who use public transportation, including inquiries regarding the availability, safety, dependability, and frequency of late-night transit. Interviews were conducted with public transportation officials, drivers, and maintenance personnel to comprehend obstacles and operational limitations after midnight. Information regarding scheduling and resource allocation procedures was analysed. Secondary data was collected by Compiling present information about late-night service schedules and ridership figures from databases or transportation agencies. Frequency of services, incidents, and feedback from customers by examining available scholarly research, reports, and articles about the effectiveness of late-night public transportation was examined. Identifying the main obstacles and effective tactics that have been used in other cities. Using review sites, social media, and online forums where people talk about their experiences taking public transportation late at night.

4) Data was analysed to understand weather people are requiring this service or not. To analyse the issues the late night commuters are facing during the night hours. To analyse the time frequency late night travellers are requiring.

5) Gap analysis was done by determining the areas with gaps in accessibility caused by inadequate coverage or premature service termination. Situations were noted in which late-night commuters are not provided with sufficient frequency or reliability of service. This will draw attention to differences in how different demographic groups are able to access services.

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IV. FIELD OF STUDY

Cuttack and Bhubaneswar are known as Odisha's "twin cities" due to their close geographic proximity each other. These two Tier-II cities combine to form a metropolitan area with two distinct municipal corporations. The public and private transportation networks in the twin cities are integrated. The three main modes of public transport are the auto rickshaw, the cycle rickshaw, and the bus. Buses are the most widely used type of public transportation in the twin cities. Capital Region Urban Transport (CRUT) is introducing new buses under the MO BUS brand in an effort to completely transform the urban public transportation landscape in the city and its hinterland through the use of smart technology, service bench marking, and customer satisfaction. However, there is a time limit that applies at night. The study area will mainly cover the major transportation hubs (bus stops, railway stations, airport) located in these twin cities.

V. OUTCOMES

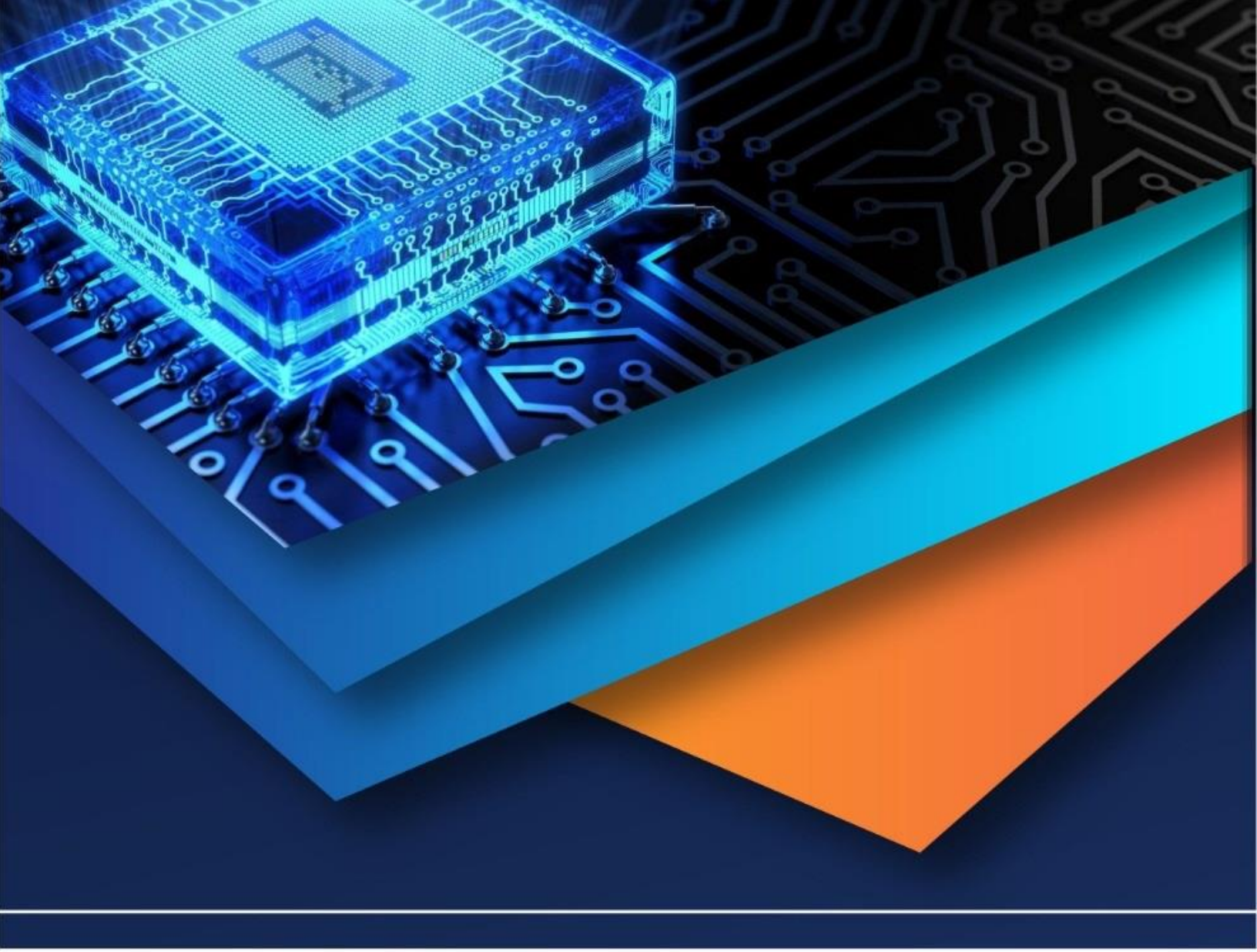
The non-travellers % is more than the traveller's%. Fewer services can be provided after midnight taking smaller % of people from the major nodes to the required destination. Mostly people are travelling within Bhubaneswar within the time 11pm - 1am then from 3am - 5am. Services can be provided in different shifts. Percentage of people travelling from auto services after midnight is more than by other modes, leading them from ride cancellation, increase in fare charges, and sometimes leading to safety issues. The buses provided for some specified routes only will be fully under public services with all the safety features intact with it, with minimum fare charges and leading to non-cancellation policy. People who require public transport services after midnight are 45.5% and people who do not require the services are less. The reasons mentioned from the survey are mostly : 1. Safety issues 2. Less commuters during night time. These issues can be taken into consideration and enhancement of the public transport system can be done for the people facing these kind of issues

VI. DISCUSSION AND CONCLUSION

Fewer services can be provided after midnight taking smaller percentage of people from the major nodes to the required destination. Mostly people are travelling within Bhubaneswar within the time 11pm - 1am then from 3am - 5am. Services can be provided in different shifts in every thirty minute or one hour gap. Percentage of people travelling from auto services after midnight is more than by other modes, leading them from ride cancellation, increase in fare charges, and sometimes leading to safety issues. The services provided for some specified routes only will be fully under public services with all the safety features intact with it, with minimum fare charges and leading to non-cancellation policy. People who require public transport services after midnight are less than the people who do not require. The reasons mentioned from the survey are mostly safety issues, less commuters during night time. These issues can be taken into consideration and enhancement of the public transport system can be done for the people facing these kind of issues.

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