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CASE STUDY ON HIGH-TECH BUS TERMINAL: SWARGATE BUS TERMINAL

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Abstract: Transport is vital for any city it is possible that it is little city or enormous city uncommonly Public vehicle. Public vehicle is the base of the city. In the event that Public Transport in the city is acceptable, at that point there will be no traffic issues like gridlock, mishaps, postpones which will one next to the other additionally decrease the contamination principally air contamination just as commotion contamination in the urban communities. Gridlock has been a day by day issue for individuals in Pune which is one of the busiest city in Maharashtra . Despite the fact that the authority government has attempted to lessen the effect of traffic issues by building up another public transportation which takes up a ton of assets and time. The real worry to this issue really lies in how individuals move between places in Pune where they continually utilizing their own vehicle like vehicles, and bikes that fill the majority of the road in Pune. Among a lot other public transportations that wanders the road of Swargate (Pune), Buses is accepted to be a productive transportation that can move numerous individuals on the double. Not with standing, the area of the bus station is presently have moved to the centre of the primary street, and its excessively far for the close by home to admittance to it. This venture proposes a positive area of ideal bus stations in Swargate (pune). We accept our proposed transport stop plan can be an intriguing choice to decrease gridlock in Pune.

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I INTRODUCTION

Mitigating road congestion is becoming a large challenge these years. One of the biggest concerns is how to move car users into the transit system. An increase in public transport's market share can only be obtained when passengers find the service sufficiently competitive. There are several ways to enhance the quality of a transit system, some more costly than others. Expectably, there would be a large correlation between the money invested and the quality of the transit service provided. However, simply planning transit operations efficiently has an appreciable impact on the service provided to the passengers

Providing service transportation which is adequate and appropriate is the challenges that encountered in almost all cities in the world. Cities will always have a new problem, which arise due to transportation system. In general, large cities in developing countries are highly dependent to the road transport. Increasing the number of residents and the use of motor vehicles has caused social and economic problems for cities that are dependent on road transport highway. Similarly, other problems will occur such as increased travel time and frequency of accidents resulting from the chronic road conges- tion, as well as environmental problems such as air pollution, vibration and extravagance of fuel consumption.

Public transport was considered as source of traffic disorder, causes congestion, the poor of services performance. So in the future, government as institution that entitled to issue a policy associated with the public interest must maintain the fairness.

With a policy that does not mean fair alignment then there will be a balance between the using of private vehicles with public transportation

The case of public transport in Swargate is the demand of using private vehicles still far larger than on the using of public transport. This is one of the busiest areas in Pune. The Swargate connects Pune to various areas like Hadapsar, Fursungi, Dhankawadi, Bibwewadi, etc. Swargate as the city certainly has a great many problems, one of them is the problem of traffic and effective bus terminal is a solution.

B.Background

The quality of the public transportation network is known to have a large influence on potential customers and in particular how inclined they are to choose it (Ceder, 2007). Adopting microeconomic terms, passengers' desire to travel would be the demand while the transit network and its particular characteristics would be the supply. Supply, in the transit context, could be e.g. the line configuration, the frequency, the stopping patterns, the structure of the timetable, the number of available seats, the in-vehicle comfortability etc. All these characteristics would, if changed, have an impact on the travel demand. Demand reflects e.g. mode choice, route choice, departure time choice and boarding stop choice (Nuzzolo et al., 2012).

Enhancing the attractiveness of transit networks is on the agenda in several cities around the globe. The purpose is ideally to move more people from the cars into the transit vehicles, thereby solving two large problems, namely, reducing emissions from the cars and relieving road congestion. There exists several ways to enhance the attractiveness of a transit network. Building new metro lines, enhancing the frequency by purchasing new rolling stock or expanding existing railway lines from single to double track are among the more costly examples. On the other hand, there exist methods to enhance the operations simply by reconfiguring the current operational plan. Changes as e.g. optimising line plan configuration, making the line frequencies and stopping patterns demand responsive or minimising passengers' transfer time by adapting the timetable are all examples requiring barely any invest- ments.

C.Public Bus Transport as Public Service

Transportation is a major component in the system of life and the life, the government system, and social system. The government conducted a public transport means that the government make policy for the procurement of transport is seen from a technical, sociological and political, such as the procurement of land, spatial and capital. This continues on the interaction government with the capital strength. To build a sustainable public transport system need of revitalization in all aspects related to public transport. Government plays an important role in the process of planning and implementation of public transport policy. Various policies that affect the transportation problems should be harmonized, so that can be run over, for example, a program to encourage the use of mass transit and reduce private vehicle (Peñalosa

Reliability of transportation as a public service to be re-viewed from the aspect of social justice should be focused on the development of public transport that is convenient, safe and cheap in order to optimize the accessibility of society. Inside is this is including the development of public transport that is integrated between each other and with the other modes. Still associated with the development of public transport as a public service in the transportation sector, have become imperative repairing in the public transport sector, especially in terms of increasing the quantity and quality of services (Peñalosa)

As a sector that serves many people, the type of public transport vehicles must be operated in compliance with the road hierarchy, capacity, and transportation demand that it served. The creation of a reliable public transport as one of the form of increased public services in the transportation sector and it is believed to decrease the number of private vehicle use. This in turn will provide benefits in addition to the economy - because of reduced congestion, waste fuel and time losses - also provide benefits in terms of public health and the environment. The travelling public has demands for transport. It is expected to be convenient, efficient, affordable and of high quality. The car meets some of these demands and will continue to do so but its impact can lead to a reduction in efficiency and convenience, journeys become longer and journey time more uncertain, and start to erode the beauty and opportunity that the city has to offer (Peñalosa Most public transport runs to a scheduled timetable with the most frequent services running to headway. Share taxi offers on-demand services in many parts of the world and some services will wait until the vehicle is full before it starts.

D.Bus transportation

Buses are the most widely used in transit technology today because bus networks are easily accessible and cheaper than other kinds of public transportation. They are operated in nearly all cities with transit service and in a majority of them are the only transit modes. Demand of passengers for using bus network is higher due to cheaper and more area cover. There are three basic agents in bus scheduling model: passenger, bus authority and traffic. Behaviour of passengers are including: payment fare, demand patterns and waiting time in bus. Bus authority is including: fleet size, fare collection system and frequency. Finally, interaction between traffic and bus network is including: traffic light, width streets and overlap of bus lines. This review covers several bus scheduling model for different position such as: peak-hour traffic, non-peak hour traffic and central business district.

The first performance characteristic of bus service is reliability. Usually it is measured as a percentage of arrivals buses at the terminus with 0 to 4 min delay, and this is depends on traffic conditions along the route. Generally, where bus stop spacing had equal intervals, service reliability was safer. The second performance characteristic of bus service is frequency. It is the main issue in increasing reliability. Proper headway buses along the route can decline delays of arrivals buses in the each stop. The third performance characteristic of bus service is capacity. Use the full capacity of buses can decrease operating costs. Usually during peak-hour traffic capacity of bus is full and may not capacity for alighting the passengers in bus stops along the route. The fourth performance characteristic of bus service is safety. It is more than the private car. Finally, the fifth performance characteristic of bus service is costs. It is including operating costs and investment. Operating cost is including: transportation, or direct costs or operating buses, vehicle maintenance and garages, general and administration, marketing and advertisings, taxes and licenses and insurance generally, with considering performance characteristics of bus operation can preparing proper bus scheduling model for different time and position.

The bus has many applications in local transit which can be summed up in the following three

It can assume the sole public transportation service of an entire town

It may be operated as a coordinated service in conjunction with rail vehicles (providing feeder, tangential, or interconnecting service)

It may provide transport connection between city centre and peripheral communities as express or main trunk lines

In its role as a complementary mode, bus transport is again a major element in any urban public transportation system. It offers flexibility to cover wide areas that cannot be covered by other mode. In addition to actuating, it needs Bus Company which will carry passenger or contents to the destination fast, safe, and no accidents with same fare and same activity without discriminations.

However to support bus company systems, it must supply bus facilities as elements that affecting the operation and productivity of agency, as well as the level of the service offered to the public. It is not concerned so much with the mechanical performance of the vehicles, but more with their functions and operational that is evident and influences the travelling public in their choice of mode E. 1.5

F.Studying the present scenario of Swargate bus terminal

- Redesigning of the existing terminal.

G.OBJECTIVES

The present study aims at developing passenger oriented optimisation models for various transit operations.

To study redevelopmemt of structure, building information modeling (BIM).

To collect data for case study and analyze it with different parameters.

To discuss recommend the suggestion and conclusion.

To design a terminal with facilities for increased number of proposed buses and passenger.

To establish a transport system which will have smooth circulation and reduce traffic congestion occurs due to the buses of the terminal.

To design a terminal with facilities for increased num- ber of proposed buses and passenger (both inter-district & international)

H.PROBLEM STATEMENT

The current situation and condition of bus stands are very poor because of that People prefer their own vehicle instead of using public transportation mode which further increases the traffic congestion and pollution on the roads.

In swarget , the public transportation especially bus is a one of a good transportation that is use as a second transport. It is commonly use by the job peroanls.. The local bus can be a high potential transport that can lead to the development of the economy, society and tourist if the bus service is excellent in terms of condition, time schedule, and bus route. In addition, the public transport can reduce the number of vehicle in swarget and avoid the traffic jam.

1) Practical View: Transportation is currently our essential need in the everyday life. Before, scarcely any years as a result of the mechanical progressions in the auto business, there is gigantic expansion in the vehicles which presently causing gridlock, security concerns and so on In any case, these headway is exceptionally valued on the grounds that it is liable for protected, solid and smooth activity of the transportation framework which is ordinarily called as Intelligent vehicle framework (ITS). It is a complete framework for secure, safe and give charming climate to traffic

So, Intelligent transport system (ITS), also called or named as Transport telematics is a transport system which uses the latest and modern technologies available for the improvement of traffic and transport network operations. The system gathered and collect all the traffic relevant data like speed, traffic volume, load carried, headway then after analysation it give results to reduce traffic congestion by providing real time information, guide traffic, reduce accidents and transport

costs. For all the operations, applications of ITS needs TMC (Traffic management Centre) where collection, analysation and combination of data with other relevant data is carried out to solve the complex transportation problems

I.ESTABLISHED METHOD

1) Intelligent Transport Systems (ITS: A bus terminal's function is to manage commuters and buses in a synchronized and organized manner, ensuring comfort, safety, and security of the terminal users (commuters, staff and operators). Terminals often fail at this, owing to lack of controlled information sharing, which causes anxiety and inconvenience among users. In India, terminals are plagued with problems like increased waiting time, uncertainty in bus arrival, and stacking of buses in the terminals. Bus schedule is often disturbed due to unpredictable factors like traffic conditions, weather situation, traffic jams, breakdowns etc. This leads to unreasonably long waiting time at the terminal, which compromises level of service to passengers, ultimately reducing the attractiveness of the facility.

Commuters at bus terminals need precise information regarding bus arrival and departure time. Terminals usually have fixed (official) bus timetables on websites or in print. But such timetables are usually static, offer limited information (operating hours, time intervals etc.), and are not updated regularly based on recent planned changes in schedule or day-to-day real-time traffic conditions. Apart from official timetables, public services like Google Maps provide bus related information to travelers . Such services, though useful, fail to bridge the information gap. Additionally, commercial bus information providers offer realtime bus arrival information but charge substantially. Total capital cost for deployment of link infrastructure to deliver transit services is very high. If transferred to end users, it would lead to an increase in mobility expenditure for passengers.

J.SCOPE OF THE PROJECT

The scope of the project lies in establishing an efficient and well occupied bus terminal at Swargate. Development and growth of the town largely depends on the efficiency of the transportation system with in the town. Due to limited land availability, modification is the only solution. A functional bus system is an essential element of intra city public transport system. To redesign of the bus terminal with respect to modern planning criteria with the best basic facilities and infrastructure being develop to the capital city of the PUNE.

K.Significant of studies:

From the study, we can learn and know the situation of the bus services in swarget, Pune. Furthermore, the most important thing is that we can provide and improve the quality of bus services and discuss recommend the suggestion and conclusion.

L.Limitation

Due to covid we can not go to bus stand. And get actual data.

•This Study consider only Swargate bus terminal.

•time constrain is there

II. LITERATURE REVIEW

A. Introduction

This chapter is discussing about the literature review on the important of public transportation in urban area and sub urban area. It will include about the facilities for bus, bus services, bus route, and passenger of bus.

2.1.Marie-Pier Pelletier, Martin Trépanier, Catherine Morency/2010, Smart card data use in public transit: A literature review, Elsevier. In the paper, the specialists give the writing survey of the utilization of shrewd information cards openly travel. There they examined about how the brilliant card are being utilized by the different public travel offices for robotized passage assortment. Other significant parts of shrewd cards like data needed to work savvy cards, security concerns, lawful issues identified with it, information stockpiling, points of interest and detriments of brilliant cards, utilization of cards at different levels are examined. All in all, they presume that it is helpful to utilize keen cards independent of some potential difficulties we are confronting.

2.2.Bhupendra Singh, Ankit Gupta/2015, Recent trends in intelligent transportation systems: a review, Journal of transport literature.In the research paper, ITS developments, technologies and applications are discussed in detail. The comparison is done between developed and the developing countries of using ITS in various aspects. This paper also highlights the conclusions which is extracted from various studies and gives the future scope in ITS field so that it became more accessible and user friendly. ITS classification terms i.e. Advanced Traveler Information System (ATIS), Ad- vanced Traffic Management System (ATMS), Advanced Public Transportation Management System (APTMS), Emergency Management System (EMS) are explained in detail. In the conclusion, they highlight the challenges of using ITS in the developing countries because of its chaotic traffic and irregular road patterns.

2.3.Capabilities and Limitations of Autodesk Revit in a Construction Technology Course Article January 2008 This paper describes the introduction of Autodesk Revit within a construction technology course, co-instructed by this paper's author, and offered to firstyear professional

M. Arch. Students at the University of Minnesota in spring semester. Revit is building information modelling (BIM) soft-

ware produced by Autodesk. Its similarity to software such as autocad or sketchup exists in its ability to construct a simulated threedimensional model of a building. But while autocad and sketchup stop at simulating the geometry of a building, Revit allows elements within a building model to be parametrically linked: the components of such a model are defined and characterized by adjustable parameters. This has several implications for design and digital modelling . First, it means that in a Revit model, a change to the position or extent of a building element will automatically update other elements to which it is linked. For example, raising the roof of a building in the model will automatically increase the height of walls whose height is parametrically linked to the underside of the roof. Or, moving a wall in the model will automatically adjust the lengths of other walls whose endpoints are linked to the first wall.Similarly, changing the location of a window in an elevation view will update the appropriate plan; changing the height of a floor in a section view will update the appropriate building elevations, and so on.

2.4. Vol-3 Issue-2 2017 IJARIIE-ISSN(O)-2395-4396 Deep Shukla1 , Krupa R Dave2 , Jitendrasinh D Raol3 A bus terminal, or terminus, is the point where a bus route starts or ends, where vehicles stop, turn or reverse, and wait before departing on their return journeys. It's also where passengers board and alight from vehicles. It also often provides a convenient point where services can be controlled from. The size and nature of a terminal may vary, from a roadside bus stop with no facilities for passengers or bus crews, to a purpose built off-road bus station offering a wide range of facilities. If the number of vehicles arriving and departing is low, a roadside bus stop, with no facilities, will normally be adequate. With a large number of vehicles arriving and departing, it may be necessary to provide off-road bus station facilities for the convenience of passengers and to reduce traffic congestion. It's essential that stations are not only constructed to a suitable design and with adequate capacity, but also that they are suitably located. There are a number of considerations in deciding the best location. The location should be where routes should logically connect or terminate, as determined by passenger demand patterns. If the station is used as an intermediate stopping point on routes passing through, it should be conveniently located for passengers joining or leaving vehicles.

2.5.Rijurekha Sen, Bhaskaran Raman, Intelligent Trans- port Systems for Indian Cities. In this paper, the researchers highlight and discussed on the problems of Indian traffic, congestions on the roads and other traffic problems which make it very difficult to implement ITS in Indian cities because mainly in India the traffic is chaotic and is totally different from western countries. Further, they discussed about the ITS applications and architecture which can be feasible and adjustable according to Indian roads and traffic. In conclusion, they told that solution of ITS implementation on the Indian cities traffic is still a big challenge for everyone.

2.6.Kenny Supangat and Yustinus Eko Soelistio 2017 IOP Conf. Ser.: Mater. Sci. Eng. 185 012022 Traffic Jam has been a daily problem for people in Jakarta which is one of the busiest city in Indonesia up until now. Even though the official government has tried to reduce the impact of traffic issues by developing a new public transportation which takes up a lot of resources and time, it failed to diminish the problem. The actual concern to this problem actually lies in how people move between places in Jakarta where they always using their own vehicle like cars, and motorcycles that fill most of the street in Jakarta. Among much other public transportations that roams the street of Jakarta, Buses is believed to be an efficient transportation that can move many people at once. However, the location of the bus stop is now have moved to the middle of the main road, and its too far for the nearby residence to access to it. This paper proposes an optimal location of optimal bus stops in West Jakarta that is experimentally proven to have a maximal distance of 350 m. The optimal

location is estimated by means of mean shift clustering method while the optimal routes are calculated using Ant Colony algorithm. The bus stops locations rate of error is 0.07% with overall route area of 32 km. Based on our experiments, we believe our proposed bus stop plan can be an interesting alternative to reduce traffic congestion in West Jakarta.

III.METHODOLOGY

The methodological discussion of this research is to describe the approach applied in order to answer the objective stated above. The methods and data used in the study are briefly presented

A. Qualitative Research Approach

This research is using qualitative research as the base of methodological discussion. Qualitative research is designed to explore the human elements of a given topic, while specific qualitative methods examine how individuals see and experience the world. Qualitative approaches are typically used to explore new phenomena and to capture individuals' thoughts, feelings, or interpretations of meaning and process. Such meth- ods are central to research conducted in education, nursing, sociology, anthropology, information studies, and other disciplines in the humanities, social sciences, and health sciences. Qualitative research projects are informed by a wide range of methodologies and

theoretical frameworks. We use in this case survey base study with the help of Google form.

1)Case Study Research: Case study research excels at bringing us to an understanding of a complex issue or object and can extend experience or add strength to what is already known through previous research. Case studies emphasize detailed contextual analysis of a limited number of events or conditions and their relationships. Researchers have used the case study research method for many years across a variety of disciplines. Social scientists, in particular, have made wide use of this qualitative research method to examine contemporary real-life situations and provide the basis for the application of ideas and extension of methods

2)Data Collection: The data collection was one of the important stages in the research activity and was carried out after the researcher was finished made the design of the research in accordance with the problem that will be researched. In this thesis both primary and secondary data were used. Primary data collected from google form. And secondary data collected from officeal website and other online sources.

3)Data Analysis: With the help of spss tool we analysis the data and as per data we prepare a revit model of our bus terminal. We get insite of problems

B.Present Condition of Bus Stand

There is neither any Bus bay marking made nor any particular pattern followed for parking of buses.

No parking facility available for 2-Wheelers near the bus stands for the persons who came from their homes to go far places through bus. As a result, they parked their vehicles on the side of the road which consumes road space No time table is available anywhere to know the Bus information.

Lack of cleanliness everywhere inside bus stand and open drains.

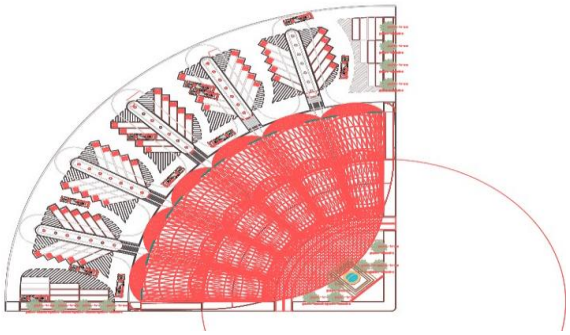
The condition of waiting room is worst. Fans not working even during summer season, walls are dirty, no dustbins to throw garbage, no points for mobile charging. Because of that some people spit on the walls.that passengers sit on the floor. No good condition Washrooms/Bathrooms available in the

Bus Stand.

No drinking water facility is available. People are help- less to buy water bottles specially during summers. Seating capacity of waiting room is less as around 26,850 passengers travelled in a day.

No police station or security office is present for security purposes of woman and tourists.

No government authorised food zone is there. Because of that, people buy food from local shops which is unhygienic and costly



•No cloak room available.

IV.SIMULATION OF PASSENGER AND BUSES BEHAVIOR IN BUS NETWORK ALSO,

3r d eye view Parking facilities

Morden bus stand view

3D View 2 - Terminal side

A.Area Configuration

B.Entry & Exit

For the terminal the bus entry is from the southern access road and exit is on to the

Main highway service lane.

Dedicated entry/ exit gate and lane has been planned for local city buses.

The private cars and public transport like auto/ taxis enter from the rear (northern side)

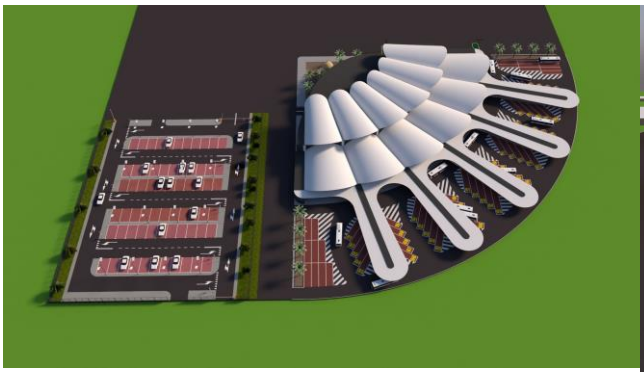
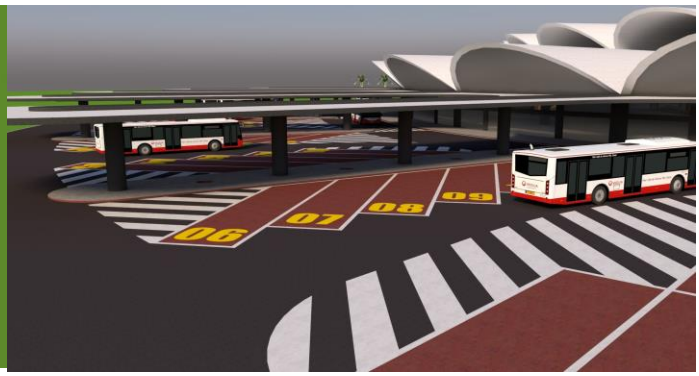
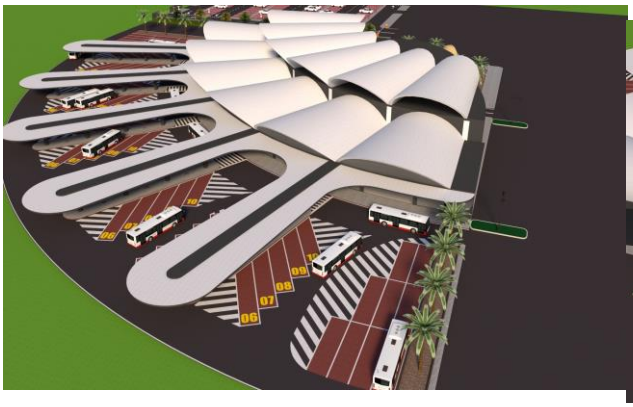
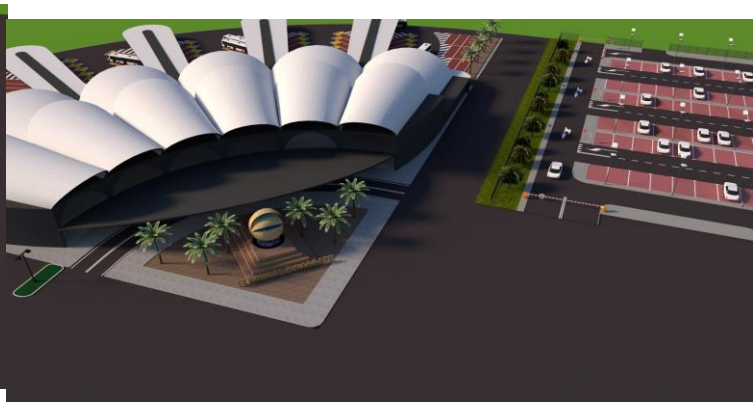
access.

Planning Configuration

Circulation

Patterns of circulation play a determining role in the architectural organization of this bus stand. In this ISBT, strict

Bus stand 3d View

One way movement

Providing clear circulation will assist the flow of passengers create regular movement patterns inside the station. Where this is well executed security cameras using smart detection systems can easily detect abnormal behaviour. Effective signage can also be used to differentiate between the different objectives in the bus stand (travel, retail, etc.) and to prioritize circulation flow

Information on the range of disabilities, including hidden disabilities

1. The skills needed for assisting disabled travellers

2. Communication and interpersonal skills for dealing with disabled people,

3. particularly those with a hearing impairment

4. General awareness of the DDA.

The total project cost including Interest during construction (IDC) component is estimated at Rs 202.23 crores.

Assumptions for Financial Viability Assessment

1) Inputs for revenue estimation: Rentals taken for commercial assessment are provided in the following table:

Other revenue assumptions

Inputs for Operations and Maintenance (O&M) Cost Estimation The table below provides the inputs to the O&M cost estimates the project.

The table below provides the inputs to the O&M cost estimates the project.

H.O&M Cost Assumptions

I.Financial Viability

The financial viability of the project has been estimated for a period of 30 years.

Assessment of Project IRR and NPV for the project (Net Surplus estimated @18% IRR)

V.CONCLUSION

A. Conclusion

Generally, delay of buses are due to some cases: more demand of passengers, depletion of fleet size, traffic characteristicand frequency of buses. Duration peak-hour traffic disorganization of bus scheduling is higher than non peak-hour traffic. Using a exclusive bus lane for bus operation can reduce disorganization Moreover, to improve bus service in crowed are as, the mixed traffic lanes and exclusive bus lane can be used together. With increasing average speed of bus in exclusive bus laneways and decline running time between bus stops, can compensate delays at the last stations. This approach reduces total delays in bus mission .For improving

bus scheduling, we suggest some recommendations: if a crowded bus arrive after a long time waiting time, indeed there is a empty bus behind this bus then come early. Learn to passengers for come near door before stop of bus in bus bays for alighting So, Attachment the bus line map in bus stops for knowledge passengers and using flexible frequency of buses instead of stable duration peak- hour traffic are other solution. plus some spare buses in terminal for necessary position for covering fleet size can help to correct implementation of bus scheduling

To remind the reader of the purpose and research question are presented once more in this chapter. The purpose of this research is to analyze the problem in customer complaint handling such as problem acoouring for passenger in swarget bus terminal. and to recommend the design of service standards that need to be adjusted with the interest of users/passengers base on the complaints, so it is expected to obtain service standards that can meet the needs of users in the use of swarget terminal.

For the first research question was therefore as follows:

What the effective mechanism to handle the complaint from the passenger of swaget bus terminal?

In this research, can be seen that it is because of too many complaints that entered and received by swarget bus terminal we did this research by analysis data in spss tool.

To decreasing the number of complaint, it must be taken some effective mechanism to handle those complaint and learning from how terminal doing their customer complaint handling, it can be conclude as several following process. They could submit or send complaints to the official website of swarget bus terminal

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