SUSTAINABLE INFRASTRUCTURE DEVELOPMENT

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Last Mile Connectivity of Lucknow Metro and Challenges Therein

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Transportation is an inseparable part of today's life. Transportation systems have been so much imbibed in our lives, especially the urban areas; so much so that it has become a part and parcel of our lives it is now a parameter of measuring growth and development of a country or a city. Also, transportation is something that always has a scope of improvisations, innovations and modernization; In order to cater the ever-increasing travel demand and in search of more viable options the idea of mass rapid transit systems came into picture of which Metro rail is a shining example. A metro project becomes successful only when it has a good last mile connectivity with the nearby areas. And the alignment passes through a densely populated area, so that the service is accessible to majority of the population. Dense population with good last mile connectivity is an assurance of good metro service or any other public transport service for that matter. Lucknow Metro has been constructed and is operational over a stretch of 8.5kms approximately, having eight stations in total namely Charbagh, Durgapuri, Mawaiya, Alambagh bus station (ABST), Alambagh, Singar Nagar, Krishna Nagar and Transport Nagar. It is among the fastest metro project works in terms of construction speed not only in the country but worldwide. The work

A Case Study on Constraints in Metro Ridership in Lucknow

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The Chapter deals with the case study on finding of various constraints that are resulting in less ridership in Lucknow Metro and also giving suitable solution for those problem that are resulting in low Lucknow metro ridership. According to Economic and Political Weekly the daily ridership of Lucknow metro is 40,000 – 70,000 passengers on an average which is only 16% of the projection made in Detailed Project Report (DPR) of Lucknow metro. Many surveys were carried out to find various reasons that are resulting low ridership namely (1) Pilot Survey (2) Footfall Survey (3) Origin and Destination Survey (4) Passenger Interview Survey (5) Speed and Delay Survey (6) Road Inventory Survey. Few broad and prominent reasons that were found causing constraint in metro ridership were last mile connectivity issue, unavailability of proper feeder service, time consuming and costly fare for shorter distance, poor connection to major places of city.

The Lucknow metro rail project is one of the most expensive projects of Uttar Pradesh, India. It is a joint venture of the Government of Uttar Pradesh and Government of India with a debt equity ratio of 50:50. The present metro work comprise of N-S corridor or red line stretching from the Chaudhry Charan Singh International Airport to Munshipulia. This corridor has a stretch of 22.87 kms. with 21 stations in total. In the N-S phase the 8.5 kms stretch was completed on the priority basis and was functional as well from 5th September 2017, which includes stations namely Charbagh, Durgapuri, Mawaiya,

Locational Viability and Accessibility of a Bus Terminal

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Lucknow is the capital city of Uttar Pradesh. It is the 11th most populous city and twelfth most populous urban agglomeration of India. Lucknow has always been known as a multicultural city. It is a very famous city in India due to its polite culture and language. In this city, there are many ancient constructions and historical places. As per provisional reports of census board of India, population of Lucknow in 2011 was 28.2 lakhs and the forecasted population in 2018 was recorded as 34 lakhs. Due to which the management of traffic problem is very necessary in crowded area like Hazratganj, Aminabad, Daliganj and Kaiserbagh, because of which the transport demand is high. As per the reliability and easy accessible, mode of bus transport is used. 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 service is higher due to cheaper and more area cover. Bus terminals are the essential component of urban transport facility, which determine the originating and terminating line for a transport system. For locating a bus Terminal it takes a strategic part of urban area. Bus

A Case Study on Safety Aspects of Urban Arterial Shaheed Path Road in Lucknow

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The team conducted a Road Safety Audit of an existing road Shaheed Path, Lucknow. It is a 23.5 km 4 lane urban arterial road for the traffic from Kanpur Road or Faizabad Road vice versa to go to other highways coming along the bypass. India has the world's most congested roads as well as the most accidents. It is necessary to make sure the safety of road users. To conduct this survey the team has followed IRC codes and suggestions in that, some of these codes are IRC: SP 84-2019, IRC: 67-2012, IRC: 99-2018, IRC: 35-2015. The road safety assessment is based on the guidelines provided by the Indian Road Congress and in addition to this, we also have a look at the international guidelines for example AASHTO and MUTCD. The team has also conducted Spot Speed Survey, Traffic Volume Survey & Accident Data Analysis and then look out for road safety measures based on road inventory survey and traffic primary data analysis. The scope of the study is to reduce accidents on the road network, reduce the severity of accidents and examine several risk factors that impact traffic safety. The team came out with the suitable traffic calming and road safety measures that are warranted in these IRC codes which will not only enhance road safety but also help in calming the traffic on this road.

Road Safety Audit's (RSA) importance can be gauged from the fact that there

Determining the PCU Equivalent of Electric Rickshaw using Microsimulation

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Electric Tricycles are also known as Electric rickshaws have flooded the Indian cities and are a choice for short trips in many cities of India. The dimension and vehicle characteristics of e-rickshaws have been impacting the traffic behaviour and capacity of roads. To study the impact on capacity and traffic the Passenger Car Unit (PCU) of e-rickshaws needs to be determined. Traffic modelling and simulation has become an essential tool for analysing networks, optimization and testing new traffic control techniques before implementation. This study aims to determine the PCU value of e-rickshaw using simulation.

Transportation forms an essential part of the Indian economy and with growth predictions showing the increase in car ownership. By 2030, five hundred million people will be living in cities as a result of rapid urbanization. Increasing income results in increased car ownership [1] which necessitates the expansion of existing transportation infrastructure. Such expansions have limited scope due to space constraints. However, improving Traffic Management can ensure better utilization of existing infrastructure. Intelligent Transportation Systems are being adopted across the globe to improve traffic conditions. Traffic simulation has been a very effective tool in the development, testing and optimization of Intelligent Transportation Systems.

Sustainable Masonry Block for Building Construction in Northern India

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Masonry block housing is widely used in the world. With the rapid recenturbanization in urban areas of Uttar Pradesh of developing India, Masonry blocks are increasingly used as a non-engineering construction. Another side, the central/state Governments formulated for low cost affordable, and sustainable housing development in the region with the goal to achieve 100 % utilization of generated Fly Ash. The construction masonry wall has an important aspect for cost-effectiveness in any building project. Since the 1950s, so much experimental and theoretical researches conducted for different issues of masonry in developed countries, therefore various factors who effect the masonryproperties like strength, stability and performance of structures had identified and design methods based on principles of engineering evolved. Simultaneously, methods of manufacturing bricks and techniques of construction have considerably improved over past days. This chapter attempts to identify best-suited option of modern masonry blocks, which will provide desired characteristics with the feasibility to develop low cost affordable and sustainable housing projects by promoting Fly ash usage for block manufacturing and prove the need of this study.

Masonry may define as building a structure by joining individual units with mortar or adhesive horizontally and vertically. The building material, its quality, how it is used and the cost of each construction material are very important in the execution of a building construction. There is so many variety of masonry unit, from which an engineer or architect may choose the one of

Gender Unbiased Sustainable Labor Workforce Management in Construction Industry

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This chapter is about how to enhance female labor productivity to increase the participation of female labor in the construction industry. Based on the out of the study, it is found that the biasness in construction industries is gender-based. And the various social reasons of business such a: Wage discrimination, Sexual discrimination, Unsociable work hours, Sexual harassment, Physical In capability, sexually inappropriate occupation, Unhealthy job relationship. But the most effective reason for less participation rate of female labor in the construction industry is low productivity of female labor compared to the male counterpart. Productivity of labor is directly proportional to the physical strength of the labor if we eliminate the physical strength by using modern construction technology (Monkey lift). We can easily enhance the participation rate of female labor in the construction industry because the productivity difference gets bridged by using modern construction technology. However, some construction activities are found to be female-friendly and no discrimination based on gender is identified, such as Sieving of aggregate, Floor Management, Scrap Identification, Curing Work, Making of Mortar, Floor Cleaning. It is also identified that cause of gender-based discrimination is primarily related to their lower physical strength.

Advantages of Carbon Fiber Reinforced Column Under Axial Load

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Corrosion of steel reinforcement is a very big problem, especially in coastal areas. Lateral ties are generally located as an outer reinforcement with respect to longitudinal reinforcement and therefore are more susceptible to severe environmental effects due to minimum cover provided. The volume of corrosion products, which is larger than that of the steel consumed in the corrosion process, stresses the surrounding concrete and initiates cracking and spalling of concrete cover. This leads to deterioration of concrete structure that has led to the need for an alternative type of reinforcement such as Fiber Reinforced Polymer (FRP). FRP is a noncorrosive material and has recently been used as reinforcement. FRP bars are corrosion resistant and 75 to 80% lighter than conventional steel bars. The use of Fiber Reinforced Polymer (FRP) in civil engineering practice is increasing day by day. Although many researchers and practitioners have demonstrated the potential of its application in various civil engineering aspects, most of them rely on its use as an alternative to retrofitting material. The use of FRP as a lateral tie in the column has not yet been fully explored. The current investigation aims to evaluate the use of CFRP as lateral reinforcement (partial and complete) in columns based on an experimental investigation.

An experimental program to investigate the structural performance of

Empirical Economic Optimization of RMC Plant in Lucknow Region

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Ready to use Concrete is a modern construction material that is widely used throughout the world by the construction industry. RMC is only useful and fruitful if it is produced and delivered on time to the customer. Long hauls, traffic delays, and the driver's route are all contributing to the delays. The study focuses on the costs associated with producing the RMC and ensuring that it is delivered to the customer on schedule. We used the multi-criteria decision-making method Analytic Hierarchy Process to determine the priority customer first so that the RMC plant's operation can be maximized through schedule management. In every case of factor comparison, this strategy uses pairwise comparison to discover the optimal combination of sets that has a lucrative impact on the RMC plant's operating process. The schedule of lucrative customers inside a series of priority lists will be determined by factor evaluations and best comparisons. When the outputs from the analytic hierarchy process method are compared to all the elements, it can be seen that combinations above a respected criteria value will result in a loss for the RMC plant, but combinations approved within a respected criteria value would result in a profit.

Ready-mix concrete is a specialized material in which cement, aggregate and other ingredients are weigh batched at a plant in a central or truck mixer before delivery to the construction site in a condition ready for placing by the